The Definitive Guide to Android
Unlock the full potential of your tablet and smartphone

GET EVERY FREE APP you’ll ever need for your phone & tablet

PROTECT YOUR DEVICE against damage, theft & malware

HACK YOUR DEVICE to make it faster & boost battery life

SECRET TIPS for your Samsung Galaxy, HTC, Nexus, Moto, Hudl & more
From the Editor

It's incredible to think that, only a decade ago, the height of mobile sophistication was a clamshell cameraphone that could just about take sub-megapixel photos and maybe play a few games. Remember the Motorola RAZR? It was a great phone back in 2004, but things have come a very long way since then.

Nowadays, even the most basic smartphone is capable of performing tasks that devices like the RAZR could only dream of: mobile web browsing, touch-screen control, high-definition video recording, media streaming, 3D gaming and more besides. Tablet devices are pushing mobile computing beyond the physical constraints of the smartphone form factor and embracing screen sizes of up to 12in. These and many of the other amazing advances in mobile technology are thanks in large part to Google's remarkable operating system, Android.

Android powers many of the most exciting devices available today, from Google's own affordable Nexus line of tablets and smartphones to the latest sleek portable products from Samsung, HTC and Sony. And Android's accomplishments cannot be overstated. This truly dynamic and adaptable OS runs on a wide range of different types of hardware and provides a platform for hundreds of thousands of great apps.

But whether you're completely fresh to Android or you're an old hand with the OS, there's always something new to learn. And that's why we've produced this guide. Inside, those who have yet to invest in an Android device will find all the buying advice they need, including reviews of all the latest tablets and phones. We'll explain how to take your first steps with your new device, then we'll build on the basics by showing how to customise and improve your Android device further. And we'll open you up to a universe of astonishing apps, many of which are completely free.

Even if you're a seasoned Android pro, you'll find this guide is full of essential tips, tricks, hacks and expert help in all areas, from boosting battery life to customising the user interface and much more.

Anyone who still thinks mobile devices are just for making voice calls can stick with their old RAZR. For everyone else, this guide will explain how to unlock the truly massive potential that your Android smartphone or tablet has to offer.
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Chapter 1
New to Android? Confused by all the different devices and versions? Don’t worry – we will explain everything you need to know.

Android comes pre-installed on hundreds of different devices, from smartphones and tablets to games consoles and set-top boxes. But what exactly is it? And why are there so many different versions, all with increasingly curious cake and snack-based names? For those coming to Android for the first time, things can seem somewhat baffling. But that’s why we’re here. So if you don’t know your KitKat from your Jelly Bean or if you’re curious to know what makes your phone or tablet tick, then read our introduction to this amazing mobile operating system to find out more.

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Introducing Android

Discover what Android is, where it came from and why Android tablets and smartphones are among the best mobile devices on the market.

Not so long ago, anyone picking up a smartphone probably didn't think much about its operating system - the software on which it runs. You'd be more interested in the manufacturer's brand, perhaps, or even the carrier you were buying it through. But these days choosing the right OS is a big decision for many people.

Right now, there are three main mobile operating systems: Windows Phone, iOS for iPhone and Android. But what does this all mean? Is one better than the other and, if so, how?

Well, while its rivals have their advantages, we think Android is the best choice for both smartphones and tablets. And, in this article, we're going to explain why.

Android basics
You'll probably be quite familiar with the friendly green fellow on the left; the Google Android logo is liberally scattered across the windows of every major mobile phone emporium in the country. But what exactly is Android? And what makes it so different to Apple's offering?

In essence, Google Android is an operating system just like Microsoft Windows or Mac OS. In fact, the source code is actually based on Linux, a free open source operating system. As with any modern laptop or desktop PC, an Android tablet or phone will come with a version of the Android OS preinstalled.

An operating system is like a fancy control panel; it deals with the complicated stuff, talking to the computer's core hardware in a language it understands, while allowing you to push buttons and flick switches to get things done. Without an OS, you'd have to type complicated lines of code to get it to do even the simplest of things.

The difference between a standard computer OS and Android is that, where Windows and Mac
The Windows alternative

We haven’t talked much about Windows Phone in this article and the main reason for this is that there just aren’t that many Windows Phone devices around, other than Nokia’s Lumia phones. Choice is also limited in terms of apps, too. The Windows Store just doesn’t have the same sort of range compared to Google Play or iTunes. When it comes to tablets, Microsoft’s current OS of choice is Windows 8 – the same operating system that runs on PCs. Again, this has some advantages – you can run desktop programs on them as well as Windows Store apps, for instance. But, overall, while Windows still leads the way on desktop and laptop computers, we feel that mobile computing is an area where Microsoft still has a lot of catching up to do.

OS were designed to be controlled via a keyboard and mouse, Android has been designed to be operated using a touchscreen. For instance, it uses finger-sized buttons and controls. It also supports ‘gestures’, such as flick to scroll and the famous pinch-to-zoom gesture first implemented by Apple in the original iPhone.

Android – a potted history

Android started out life in 2008 on a smartphone. At the time, the only rivals to the Apple iPhone were complicated and fiddly to use on a touchscreen (such as Windows Mobile), or were corporate devices aimed specifically at business people and didn’t support touch operation at all (such as the older BlackBerrys). Google spotted a gap in the market and, in partnership with Taiwanese smartphone manufacturer HTC, produced the G1 smartphone. It was plagued with problems: battery life was poor, it was very basic and there weren’t many apps to start with.

Google quickly improved Android, however, moving from version 1 to 1.5, then 1.6. Since then, it’s gone from strength to strength, moving through the gears with versions 2 to 3.3 before introducing Android 3, the first tablet-specific version. Since Android 4 arrived, there have been several major updates, all leading towards the very latest version, 4.4, due to arrive on select devices in late 2013.

Google gives each version of Android a dessert-related codename; the current version 4.4 is known as KitKat. Other notable codenames include Jelly Bean (version 4.1), Ice Cream Sandwich (version 4), Honeycomb (version 3) and Gingerbread (version 2.3). See page 14 for more on the various.

Android now

Today, Android comes preinstalled on all manner of devices, from a wide range of manufacturers. You’ll find Android on smartphones, compact tablets with 7in screens and larger tablets at 10in or above. Some manufacturers have even attempted, with limited success, to put Android on laptops and PCs. And most of the big names in the consumer electronics industry have built entertainment devices around Android: Samsung, Motorola, Acer and Asus to name but a few.
This means there's a huge variety of devices with Android on board, from powerful tablets made by big-name manufacturers, like Samsung and Asus to cheaper products, like the Tesco Hudl, and smartphones to suit all budgets. There's healthy competition among manufacturers of Android tablets and phones, leading to greater choice for you.

Better than Apple
As well as variety of choice, Android devices hold other advantages over the Apple products, too. One of these is connectivity. On an Apple device, there's no way of expanding the memory, for instance, but on most Android tablets and phones you can usually slot in a memory card to boost the amount of storage space. Rather than being stuck with whatever you can afford when you buy, with most Android tablets you can increase storage by up to 32GB when the need arises.

Another advantage of Android devices is that you can drag and drop whatever files you like in and out of the tablet or phone memory. If you want to use software to synchronise your music, video and photos, you're not limited in your choice either as there are plenty of options.

Widgets, meanwhile, give you a window on all manner of your personal information directly from the tablet's homescreen; Apple's iOS devices can't offer this sort of rich interaction. And with these widgets offering at-a-glance updates, they can save a lot of time, too.

The biggest advantage with Android, though, brings us back to that variety of choice. If you buy into the Android way of doing things, your future upgrade options aren't dictated by the whims and mood of a single manufacturer. If you see a tablet in the shops made by a different manufacturer, for example, you can simply make the switch and take all of your apps with you. And if you can't afford to buy the top-end devices, there are plenty of budget Android devices to choose from.

In short, Android is a much more flexible operating system than its main rival. It's available on more devices at more price points, it doesn't carry as many restrictions, and it leaves your future choices much more open.

Apps for everything
Apps are central to the success of Android as a platform. Android owners have a huge choice of games, email programs, productivity tools, music and video players, news and sports apps, and more. Not all Android apps will run on every Android device - some need the latest phones or tablets, while a few require a certain screen size, and so on, just as some programs for a PC have specific minimum requirements in terms of the amount of memory, or a particular version of Windows needed to run.

But, the principle is broadly the same. If a device runs Android, it will run a huge number of apps, and though there are some small changes in the way some actions are done between older Android devices and newer ones, or between tablets and phones, they are not complicated, and we will explain them where necessary in this guide.

Android apps are cheap - often free - and, like the OS itself, they're simple to use. On page 45, we explain everything you will need to know about

Yes, the latest version of Android is named after a choccie bar
apps, including where to get them and how to install them. And to help inspire you to see what can be done with an Android device, we have listed some of our favourite apps for both tablets and phones, starting on page 44.

**Value for money**

Of course, Android isn’t just about apps. Because it’s free, even relatively cheap phones run the operating system, and increasingly people are using Android because that’s what came on their phone, rather than seeking out an Android device specifically.

Some of these bargain phones might not have that latest version of Android, but they are still capable devices, and we’ve got plenty of information inside this guide to help you make the most of any ‘droid’, from budget phone to top of the range tablet.

If you’ve been using Android for a while and you’re wondering whether or not it’s worth upgrading from an old device to something much newer, take a look at our buying advice on page 20 – which is just as useful if you’re thinking of dipping a toe in the water for the first time. Are those bargain basement Android tablets you find in some stores worth the money, or will they turn out to be a false economy? What are the real differences between the versions of Android – and does it even matter? We’ve got it covered, along with advice about how you can make sure you stay safe from rogue apps, and ensure your private data isn’t shared without your permission (from page 108), and guides to uncovering the many hidden features in Android (from page 118).

All work and no play is boring of course – and whether you have a tablet or a smartphone, an Android device can be used to relax. You can access great services such as Netflix, or the BBC iPlayer, as well as playing a huge range of games, many of them free of charge.

Fancy a little something to listen to? You can use your tablet or phone to play music or watch videos, and of course you can even view and edit photographs – your device may take them too, if it has a built-in camera. You can turn a tablet into an ebook reader – in fact, some ebook readers are just Android tablets in disguise. You’ll learn about all this, and more, in Chapters 5 and 6 of this guide, from page 82.

**The Apple advantage**

We shouldn’t ignore Apple’s advantages. The iPad is the most established tablet on the market, after all. Apple exerts a lot more control over things than Google does. This can have its downside but it also means that Apple checks each and every new app before it’s made available, which helps weed out substandard offerings of dubious value. The quality of its App Store is high, whereas Google Play can sometimes seem like a bit of a Wild West.

By controlling the hardware as well, you can be confident of a slick interface and smooth performance with any iPad. The newer Android tablets made by big-brand companies all include fast processors and lots of memory, but there are dozens of Android tablets made by manufacturers that have poor build quality and weak specifications. As such, be careful before you buy. If you’re still on the lookout for a new tablet, read our reviews.

However, if value for money, flexibility and choice are more important to you, then we reckon you’re much better off with Android than Apple. So, whether you’re new to Android, or a long term user, turn the page and start to find out how you can make the most out of the amazing array of tablets and smartphones available, whether you’re at work, rest or play.
Android versions explained

There are many Android variants around – find out why and what the main differences are.

As we saw in the previous article, there have been a number of versions of the Android operating system released over the years. Rather than each new version replacing the last, however, there are often several versions of Android in circulation at any given time. Not every app will work on all versions, and many devices can't be upgraded to a newer version. Not only that, but manufacturers also tend to make their own changes to the 'stock' Android OS, meaning that the operating system can look and work quite differently from device to device. In this article we will explain the main differences between the various versions of Android to help you avoid such pitfalls.

Ancient history
Android version 1.0 appeared in 2008 and, like the subsequent version 1.1 in 2009, it had no code name. Version 1.5 was the first with a codename (Cupcake), and the first with an onscreen keyboard. Devices using this or earlier versions might be found secondhand, but few modern apps will work on them, and they should be avoided.

Version 1.6 (Donut) included a Search box and support for different screen sizes, but it was not designed with tablets in mind. Application compatibility is not good, as most software companies now only create apps for version 2 or later.

Version 2.0 (Eclair) allowed users to add multiple email accounts, and added a browser with HTML5 support. There were several versions before the next major update, including 2.1 (Eclair_MR1), 2.2 (Froyo) and 2.3 (Gingerbread), as well as several minor update versions. Gingerbread is one of the most widespread versions still in use, accounting for almost 17 per cent of all Android devices. There is still a number of Gingerbread and Froyo phones in circulation and, although they should run most apps, this isn't guaranteed. Eclair, Froyo or Gingerbread tablets lack USB support and the operating system isn't designed for large screens.

Android for tablets
Version 3.0 (Honeycomb) was the first version designed for tablets, and there were two minor updates with versions 3.1 and 3.2. It had a new interface for tablets. It also enabled the use of USB devices. Honeycomb is the earliest operating system we would recommend using on tablets, but it is unlikely that Honeycomb devices can be upgraded to newer Android versions.

Android 4.0 (Ice Cream Sandwich or ICS) was the next big milestone. It has the same interface on tablets and smartphones. Two minor updates were released, 4.0.3 and 4.0.4.

The next version was called Jelly Bean. It launched with version 4.1 and was updated to version 4.2 in late 2012 and again to 4.3 in 2013. The first version looked similar to ICS, but brought some performance improvements. Version 4.2 made changes to the interface. It also added the ability to have more than one user account on tablet devices. Version 4.3 added 4K video compatibility and updated wireless and Bluetooth support.

Many current Android devices are sold with Jelly Bean and ICS, even though they're not the very latest versions. This is normal – often the cheaper the device the older its Android version. But if you're buying a new Android tablet or handset...
now, we would advise opting for one with Jelly Bean and above if possible.

**The latest and greatest**

The latest version of Android is known as KitKat and it's officially version 4.4 - in fact, at the time of going to press we were up to version 4.4.2. KitKat brings with it a number of important changes. The user interface has, as always, been refreshed. Apps can now run in 'immersive mode', which automatically hides everything except what you really want to see. KitKat brings with it a brand new camera app (find out how to use it on page 84) and built-in support for Google Cloud Print. Google Now can be activated by voice, too - just say "OK Google" when you're on your home screen and then speak your commands to search the web, launch an app, find a contact, play a song and more. It's basically Android's version of Siri, but better.

**Why can't I upgrade my device?**

On devices running 'stock' Android, such as Google's own Nexus devices, upgrading to the latest version is usually straightforward. Your tablet or phone will automatically check for available updates and you'll see a notification. You can check for new versions manually by tapping Settings, then 'About tablet' (or 'About phone'), then 'System updates' and 'Check now'. On non-stock models from other manufacturers, however, it's a different story.

Android is a free operating system, so there is nothing to stop manufacturers adding their own apps or customising the interface, which can make things confusing. There are many cheap devices, particularly tablets, that don't meet the official Google specifications and can't use the Google Play app store. Many of these dirt-cheap tablets are not worth bothering with, as they run ancient Android versions on low-specification hardware, and are unlikely to get any updates.

One complaint some people have about their Android devices is that they can't upgrade to the latest version of the operating system, or that they have to wait a long time. Sometimes, devices are simply abandoned by the manufacturer, who would prefer customers to upgrade to a brand new handset or tablet. Occasionally, it may not be possible for the hardware in an old phone to run the latest version of Android either - though that seldom happens. In some cases, your mobile network carrier may prevent you from upgrading Android - see the box below to find out why.

**We've got you covered**

For the purposes of this guide, we're going to cover as many of the current versions of Android as we can in our instructions and advice. Most of Android's key functions and features remain largely the same across recent devices, though there may be subtly different ways of carrying out tasks or accessing specific settings. We'll point these out as we go, though bear in mind that, for the most part, we will be sticking with Jelly Bean and KitKat for our screenshots.

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**Contractual obligations**

Another big problem, often affecting phones, is that the version of Android may be customised by your mobile network, for example to have special apps for specific network services. Often these apps take up space, and can't be uninstalled, just to add to the frustration. And, while a device bought without a contract might have the 'plain' version of Android, if yours has been customised for a particular mobile network, an upgrade often won't be forthcoming until the network approves it.

It is sometimes possible to install unofficial updates, like those from CyanogenMod (www.cyanogenmod.org) but it's not a straightforward process, so we don't recommend it for novices. Those with unlocked (SIM-free) phones are more likely to get updates, but they will have to contact the manufacturer directly to get the details.
The Android home screen

Getting to know your Android device starts with the home screen. We help you familiarise yourself with its features.

Here are 101 different things you can do with your Android device, from browsing the web to playing videos, from streaming music to editing your holiday snaps, but it all starts at the Android home screen. When you switch on your tablet or phone it's the first thing you see; it's where you launch your favourite apps and games from, and you can use it to keep an eye on your email without lifting a finger. If you're used to using a Windows PC, a laptop or a Mac, many features will look familiar. The main part of the screen, for instance, acts as a workspace you can customise and drop various items onto. These items can be shortcuts for apps you've downloaded, bookmarks for your favourite web pages or one of Android's interactive widgets - a clock, for instance, or the weather forecast. Unlike a PC or Mac, though, Android isn't limited to only one desktop space. Sweeping your finger right or left on the desktop reveals more home screens. Adding items to them is simply a matter of opening your apps or widgets list and dragging something onto one of those screens. You'll see an outline appear showing where on the page it will sit before you drop it in place. You can also change your home screen wallpaper by holding a finger on any empty space.

Quick Settings

Android’s key settings can be quickly accessed on the latest devices by dragging down from the top right hand corner of the home screen. On some devices doing this will show the notifications screen and you'll then need to tap the icon with six squares in the top right. Use the Quick Settings to select Wi-Fi networks, check battery, switch on Aeroplane Mode and more.

More to explore

But there's much more you can do from the home screen. At the top-left corner of the screen, you'll see the Google logo. This brings up the quick search window. From this one box, you can search the web, and the contents of your device all at once. To use it, tap the Google logo and begin to type using the keyboard that pops up. Or hit the microphone icon and your device will try to recognise spoken commands. If you're using a KitKat device, you don't even need to tap the microphone icon - just say “OK Google” to start talking to your device. Swipe down from the top to see your notifications, access your Quick Settings or swipe from left to right on the main home screen to open Google Now.

Despite the differences between brands of Android device, the basic way they work is the same, even if the colour schemes and graphics have been changed. Opposite, we explain some of the key functions of the Android home screen on both phones and tablets, showing images taken from a Google Nexus device running ‘stock’ Android 4.4 KitKat and an Xperia Z2 running Sony's own customised version of the operating system. Older devices, products from other manufacturers and large-screen tablets may look slightly different.
THE HOME SCREEN

1. SEARCH
Tap in the search box to search phone contacts, or online with Google. Tap the microphone (or say “OK Google” on new models) to say what you want to look for.

3. APP ICONS
Just tap an app icon on the home screen to launch it. Swipe left and right to see more screens. Tap and hold an icon, then drag it to the top of the screen to remove it.

5. APP DRAWER
Tap the icon with the dots to see all the apps on your device - see the screen below.

6. FAVOURITES TRAY
Apps that are dragged into position at the bottom of the screen appear on all home screens, so put your most used ones here - like the Settings or Messaging apps.

2. WIDGETS
Widgets on the home screen provide at-a-glance information like the time or weather. Tap one to see more information.

4. FOLDERS
The icon at the left is a folder; drag apps on top of each other to make a folder, and tap the folder to access its contents.

THE APPS SCREEN

1. NOTIFICATIONS
Notifications appear at the top left of all screens. In recent versions, pull down from the top left to see them. In older ones, the Quick Settings also appear.

2. APPS
Tap an app to launch it, or hold down your finger and drag an app onto one of your home screens. On older versions you can browse widgets here too.

3. PLAY STORE
Tap this icon for a quick way to launch the Google Play Store to get more apps, music, movies and books. You can also access Google Play via a browser on your PC.

4. BACK
Wherever you are, the back button will take you back to the last screen you were on. Its exact function depends on what you’re doing at the time.

5. HOME
Tap on Home at any time to return to your device’s home screen – if you can’t see Home, Back or Recent, tap at the bottom of the screen to reveal these three icons.

6. RECENT APPS
Tap here to see which apps you’ve used recently. To switch between apps, tap Recent Apps, swipe through the thumbnails and tap the one you want.
Buying advice

If you’re thinking of buying a new Android device and you’re after some advice, you’ve come to the right place.

If you haven’t bought an Android phone or tablet yet, or if you’re about to upgrade to a new model, then you’ll probably be looking for some help deciding what to go for. And we don’t blame you – the selection of devices available is offputtingly vast with prices and features ranging wildly from product to product. Luckily, we’ve tested all the latest Android devices to help ensure that you make an educated choice. In this chapter you’ll find reviews of the cheapest budget Android phones and the best new tablets, as well as some essential points for consideration before you reach for your wallet.

HIGHLIGHTS

20 Get the right Android device for you
We explain your options and help you choose the most suitable phone or tablet

24 Android smartphones group test
Bag a bargain with our comparison of the best budget Android handsets available

30 Android tablet reviews
Looking for a new tablet? Head here to read our reviews of the latest and greatest models
Get the right Android device for you

The market for smartphones and tablets has exploded. We guide you through the seemingly countless options.

Here's a big shift happening in the world of computers at the moment. Initially kickstarted by Apple's iPhone and iPad, more and more of us are going mobile, and using portable devices that have more power than some of the desktop computers of just a few years ago.

Despite being just a few years old, the Android operating system is now the most popular choice, found on a huge range of tablets and smartphones – and with some of the latest phones boasting massive screens, the lines between the two categories are blurring, making it even harder to choose the right device. So, let us guide you through the world of Android and explain what you need to know, whether you're buying your first device, or hoping for an upgrade.

Tablet or phone?
Let's start with the obvious question: what type of Android device should you get – a tablet or a smartphone? Well, the rather obvious answer is that it all depends on what you need from your device and how you intend to use it. The key differences are size and the ability to make phone calls.

So if you need to be able to take your device everywhere with you and if you want a single device that can be used for traditional voice calls as well as modern social networking, emails, web browsing and so on, then an Android smartphone may be the answer. If you're looking for a replacement for a cumbersome old laptop, on the other hand, or if you'd prefer a big screen for reading ebooks and editing documents, then you could opt for a larger phone – some Android handsets have screens that go beyond 6 inches – but a tablet is more likely to be the way to go.

But what exactly is a tablet? Is it a laptop with no keyboard? Is it just a big smartphone? Or is it something else entirely? The answer is that it is a mix of all of these things and, depending on what you want to do with a tablet, maybe more besides. Web browsing is perhaps the most popular activity for tablet owners, but reading and replying to emails and messages, playing games, checking calendars and performing simple productivity tasks, such as editing documents, is also possible.

At a glance, the technical specifications of some tablets might look similar to a PC, with references to specs such as processor speed, memory and connection ports. However, while some of this is useful to know, the experience of using a tablet is far more important than the stuff inside that drives it. If a tablet works smoothly and is a pleasure to use, then its technical make-up means little.

In recent months, dozens of tablets have been released onto the market, some of which are very capable machines while others are downright awful. The good news is cheaper tablets are getting better, with improved operating systems and build quality. But what should you look out for when making a decision on which tablet is right for you?
Operating system
At the heart of your device is the Android operating system. But it’s not just a single thing – just as ‘Windows’ might refer to XP, Vista, Windows 7 or Windows 8. And some versions are definitely much better than others.

We’ve explained all the different Android versions on page 14, but essentially you should probably be looking for the newest one you can buy, especially for a tablet.

Confusingly, and for reasons best known to themselves, some manufacturers have released devices that use their own highly customised versions of the Android operating system. They limit access to applications and include features that simply don’t work. While old Android operating systems are not recommended, customised versions can be even worse.

With Android, it is essential to ensure the device is certified by Google as being ‘Android-compatible’, otherwise it won’t be able to access all the features of the operating system, including the Google Play Store.

The operating system has a significant influence on the usability of a device, but it’s not the only factor.

Android can be customised in several ways, from personalised home pages to applying ‘skins’ that give the operating system a different look. It’s common for manufacturers to produce Android phones and tablets that come with skinned versions of the operating system. In fact, only devices with the Nexus name, such as the Samsung Galaxy Nexus, and the Nexus 5 – both smartphones – or the Nexus 7 and Nexus 10 tablets, are guaranteed to have a plain version of Android. If you want the pure Android experience that’s where you’ll find it. A Nexus device should receive the latest updates pretty fast.

By contrast, other manufacturers tweak Android with their own look and feel, such as HTC’s Sense and Samsung’s TouchWiz. Most of the key Android features are the same, but these systems typically add extra widgets to the home screen, or easier ways to share things online, or via your home network.

Hand in hand with the operating system come apps – the programs that can be downloaded to a tablet to add tools and features. Most Android devices have access to Google’s Play Store – see page 42 for more details – and frankly we wouldn’t buy a devices that didn’t. And, though the most popular version of Android isn’t always the newest one, there are more and more devices that run Android 4 and above. In practical terms, that means

Upgrading your handset
One of the best ways to get yourself a great new Android device is to upgrade your mobile phone. The latest devices, like the Google Nexus 5, Samsung Galaxy S5, HTC One M8 and Sony Xperia Z2 are powerful, with great screens, and capable of running all the latest Android apps. You can expect to pay up to £500 if you buy one of these without a mobile phone contract, but they’ll be substantially cheaper if you can upgrade or start a new contract. However, do remember that, in most cases, you’ll then be tied in to a two-year deal with the mobile phone company. For that reason, we think upgrading to a cheaper model with limited memory or a poor choice of sockets isn’t worth it. You may end up frustrated well before the contract comes to an end. That’s not to say all budget smartphones are bad. See our reviews on page 24 to find our which ones are best.
that right now, most people creating apps build them to run on as many devices as possible, often back to Android 2.2, but that won’t always be the case. So, we recommend that you choose a device with a fairly recent version of Android, especially if you’re looking for a tablet.

Big or small?
A key part of the appeal of tablets is their portability, so size and weight should be considered carefully. Tablets might all look similar but, in fact, the weight can vary a lot. Apple’s iPad Air, for instance, is a little over 470g, while the Kobo Arc 10 HD is 160g heavier at 630g.

Weight and size can not only affect portability, but can also have a big impact on how comfortable a device is to use over lengthy periods. Smaller-sized tablets may be the answer if both of these factors are important to you. 7in tablets, such as the Nexus 7 are much easier to carry around in a briefcase or handbag and more comparable to an ebook reader in terms of how comfortable they are to hold. These days, many product lines, such as Samsung’s Galaxy Tab devices, come as either a ‘full-size’ tablet with a 10.1in or larger screen, and a ‘mini’ version with a smaller display of around 7in.

Smaller still and tablets start entering into the smartphone/tablet hybrid territory, like the

Samsung Galaxy Note 3, which are sometimes referred to as ‘phablets’.

With tablets, smaller usually means less expensive too, if budget is a concern. At the time of writing, for example, the 7in Samsung Galaxy Tab 3 is more than £100 cheaper than the 10.1in model.

Usability
It doesn’t matter how fast a device’s processor is or how much memory it has if it takes half a dozen attempts to respond to your touch gestures. As a rule, cheaper products tend to compromise on the quality of the touchscreen. This impacts the viewing angle, so the screen needs to be held just so for viewing. Many tablets have shiny screens that reflect everything, especially in bright conditions. The Nexus 7 and Samsung models have excellent screens, for example, but some are so wretched, they render that device more or less unusable, so it pays to look before buying.

Cheaper tablets and phones can be unresponsive and slow too. Typically, tablets priced below the £120 mark need very careful consideration because the old adage of getting what you pay for often rings true here. When it comes to phones, the situation is complicated by the subsidy that comes with a mobile contract; but recent models with dual or quad-core processors run very smoothly, and Android 4.3 and above is much slicker to use than previous versions.

Connectivity
Unlike the iPad, which comes with Apple’s proprietary Lightning connector, most Android tablets are festooned with sockets. It is common to find USB ports on tablets, for example. Many also feature HDMI sockets and memory card slots. Some of the latest mobile

Choosing a mobile network
Deciding which mobile service provider to go with for your Android smartphone or 3G/4G-enabled tablet can be even more confusing that choosing the device itself. Not only do you need to weigh up costs, but you’ll also need to consider things like coverage, speed (3G versus 4G/LTE) and whether or not you want to go on contract or opt for pay as you go. Added to that are various other less obvious perks. Many mobile providers, including Vodafone, also offer free access to a wide network of public wi-fi hotspots, for example, while the two-for-one cinema tickets offered to EE users may be tempting for regular movie goers. We don’t have anywhere near enough space to weigh up the various operators in the UK and their current deals. Our advice is to head to www.broadbandchoices.co.uk/mobile, where all the latest offers are compared.
phones can provide an HDMI connection, using adaptors called MHL (Mobile High-definition Link) or Slimport, both of which plug into the USB port. Devices with these connections can be connected to a TV – so they can be fun for gaming, or for watching TV programs and films, using services such as iPlayer, Netflix or Google’s own film rental service. You can read more about that in the Entertainment chapter of this guide.

Wireless connectivity is more important and also a bit more confusing. You’d be hard pushed to find a phone that didn’t have Wi-Fi and 3G, and some of the latest phones support 4G. Many tablets come in both Wi-Fi and 3G/4G versions (or both combined), meaning they can connect to the internet in different ways. Wi-Fi-only tablets require access to a wireless network, so you’ll need to be at home or near a Wi-Fi hotspot to go online.

On the other hand, 3G/4G tablets can connect via mobile phone networks and require a SIM (just like a phone). You should be aware that mobile data plans can be expensive, and coverage in some parts of the UK can be poor. You’ll also often pay more for the 3G/4G tablet in the first place, though you may be able to get one with a subsidy from a mobile network.

Storage space
Much like a computer, the main purpose of storage on an Android device is for software (apps), music, photos and movies, but not really so much for documents. Most recent devices are offered with either 16GB or 32GB capacities, though some may have 8GB or even less. This might sound tiny compared with modern PCs, where hard disks are now measured in hundreds or even thousands of gigabytes. However, apps tend to be smaller than their desktop computer equivalents, and unless you’re planning to install an awful lot of media, the capacity isn’t something to worry about too much. One thing to watch out for, however, is that not all devices have a memory card slot. In those cases, we’d recommend buying a device with as much memory as you can afford.

Everything else
Most tablets and virtually every phone have one or two built-in cameras, but on tablets, these tend to be pretty basic; for example, for use with video-chat software such as Skype. Some of the latest phones have excellent cameras, but remember that it’s not just the number of megapixels that counts – a good quality lens is just as important.

Similarly, location tools such as compasses, and GPS and orientation technology such as gyroscopes and accelerometers, are common – and all add to the Android experience. The first two, for instance, can be used in combination with satellite-navigation software, while the latter pair combine to make games more interesting, with tilt and turn controls.

Finally, you may also want to consider whether or not you want to use a stylus. Most Android devices are designed to be used with just your fingers, but others offer the option of pen input too, including the Samsung Galaxy Note range of tablets and phones. Using a stylus largely comes down to a matter of taste. They can be cleaner and more precise than a finger, and many stylus-based devices include handwriting recognition that automatically turns your scribbles into text.
GROUP TEST
Budget Android smartphones

Android smartphones used to cost hundreds of pounds, either upfront or through expensive contracts – but not any more. We tested 10 of the best budget Android handsets.

Budget smartphones used to be a frustrating exercise in compromise. The very things that made the phones smart, such as a decent touchscreen and enough power to run apps, were amongst the sacrifices you had to make to buy an affordable model. However, in the past few months we've seen a number of phones launched that cost between £100 and £200, but still have the features and specifications to justify their smartphone status.

We've reviewed 10 of the latest budget Android models, comparing performance and battery life, and scrutinising their features and value for money.

Motorola Moto G
£99.99 (PAYG)

www.argos.co.uk

Winner

The Moto G is quite chunky compared to some of this group test's slimmest models but its curvaceous shape makes it a pleasant phone to hold and have in your pocket.

The extra bulk has been put to good use, and it's the only phone in this group test to have a splash-proof coating, to protect it from exposure to moisture. It isn't designed to be completely submerged, though. As well as resisting water, its tough, shatter- and scratch-resistant Gorilla Glass front is another bonus for accident prone smartphone users.

It's when you turn it on that the Moto G really makes an impression, though, because the display is beautiful. We've become used to manufacturers skimping on resolution, quality or both on budget smartphone screens but the Moto G changes the game, with a 720p IPS display that's amazingly bright (maxing out at 436 cd/m²) and has a decent level of contrast (991:1). It delivers superb image quality all round, with a perfect colour balance.

On the downside, it's the only phone on test not to have a microSD slot for memory expansion, which will be an issue for those who like to pack their phones with stuff without having to worry about managing their space. The smallest model has 8GB of storage, though, which is enough space for plenty of apps, a handful of big games and a small music collection.

The Moto G is the only phone in this test to have been updated to Android 4.4 (KitKat), which introduces voice-activated control, adds music controls to the lock screen and prioritises commonly called...
numbers in the Contacts view. There's also a new 'immersive' mode, which hides toolbars when watching movies, reading books or playing games.

In everyday use this handset feels as fluid as any top-end smartphone. Browsing complex web pages and apps like Google Maps is taken in its stride, and there's no evidence of typing lag. A light vibration on each keypress helps with the sense of immediacy, and really makes a difference when writing messages and social network updates.

The phone's quad-core, 1.2GHz Qualcomm Snapdragon 400 processor and Adreno 305 graphics chip perform well. Its 1fps in the GFXBench T-Rex HD test is behind the Samsung and Sony phones, but the Moto has more than twice their pixels on its screen.

Its SunSpider results were fourth in our tests, but it's very close behind the Samsung, Acer and Alcatel phones, with less than 100ms between it and the fastest Samsung phone.

Its battery life was sixth overall, again hampered by the extra power needed to keep its more sophisticated screen bright, but it still lasted well. We found that an hour of gaming drained 23 percent of its battery, an hour of video drained 19 percent, and an hour of audio streaming over 3G drained 11 percent of the battery.

The camera is its most unremarkable aspect, snapping photos at a maximum of 5 megapixels. Picture quality is reasonably good, with plenty of contrast, and the camera is easy to operate. The video option will shoot 720p footage at up to 30fps, but the quality isn't great. Call quality is satisfactory, though, with no sign of distortion or calls dropping during our tests.

**OUR VERDICT**

The Moto G set a new standard in affordable smartphones when it launched, and while competitors have rallied with some excellent affordable rivals, the Moto G is still the original and the best.

It isn't a clean-sweep for the phone, since it doesn't support 4G or NFC. On top of that, you can't replace the battery, and there's no microSD card slot to expand storage beyond what the phone comes with.

However, its superb screen and comparatively good performance give this great value phone a bit of indulgent luxury that defies the price you'll pay for it.

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**Samsung Galaxy Ace 3**

£138.95

[www.simplyelectronics.net](http://www.simplyelectronics.net)

**Recommended**

The build quality of Samsung's budget phone is superior to all the other budget phones we've reviewed here, with glossy plastic and a shiny chrome-effect trim inspired by the Galaxy S4. It has a removable back plate, which provides access to the battery (which can be swapped if it wears out) and the microSD card slot for adding memory.

The phone runs Android 4.2.2 with Samsung's TouchWiz software laid over the top. This includes some useful additional features including Smart Stay, which recognises the close proximity of your face and stops the phone from shutting down if you're still looking at it. The Ace 3 supports both 4G and NFC.

Call quality was good in our tests, and its 4.3in screen is rich and colourful, with a contrast of 790x.

Internally, the Ace 3 has similar specifications to the Moto G, but Samsung has tuned it well. In the GFXBench T-Rex HD test it got the joint-fastest score, tying with the Sony Xperia L. It also came top in the SunSpider test, with a time of 1.252ms.

Battery life is acceptable. We found it lost 23 percent of battery capacity per hour when playing demanding games, 22 percent per hour when playing video and 9 percent per hour when audio streaming over 3G.

Its 5-megapixel camera isn't great, however. It captures detailed and well-exposed photos in daylight but it's a poor performer in low light, producing pale, blurry images.

**OUR VERDICT**

For full features and top performance, the Samsung Galaxy Ace 3 is an amazing phone. However, it's slightly more expensive that our favourite budget models.

Its higher price is arguably justified, with a better build quality, 4G and NFC built into the phone. Luxuries like these may be overkill in a budget device, however, when cheaper phones have useful things, like the Moto G's splash-proof case.
Alcatel One Touch Idol S
£99.99 (PAYG) **Recommended**

The name Alcatel is a blast from the past – a mobile phone manufacturer that had a good range of handsets in the early days of mobile phones but hasn't made much of an impact on smartphones. This budget model could change that, however. The One Touch Idol S gives the Moto G some stiff competition without being more expensive.

The design is stunning, just 7.7mm thick, with soft-touch plastic on the back that gives it the impression of luxury. It has a large 4.7in IPS display and is the only other phone we tested to match the Moto G's resolution of 720 x 1280 pixels. It has an 8 megapixel camera, a quad-core 1.2GHz Qualcomm Snapdragon S4 Plus processor, 4GB of storage and can connect to 4G mobile networks. This is largely an improvement on the Moto G's specification – its built-in memory is smaller but it has a microSD memory card slot, so can be expanded beyond the Moto G's capacity.

Its superior screen resolution sees it suffering in the GFXBench test, managing a frame rate of only 8.6fps, which is well behind the Moto G. It performed slightly better in the SunSpider test. In practice, this means it isn’t the best handset for playing the latest games but you won’t notice its frame rate reduction for normal tasks, such as browsing the web.

Battery life is shorter than the Moto G’s. Video playback drained the battery at 25 percent per hour, games drained it by 22 percent per hour, and even 3G audio streaming drained it at 11 percent per hour.

The camera has a high pixel count but its photos are slightly over-exposed. In daylight it’s as good as the Moto G but it falls behind a little in low light, with colours becoming a bit paler.

**OUR VERDICT**
The Idol S is a superb handset that matches the Motorola Moto G almost all the way. Its slimmer design, larger display, 4G connection and microSD slot push it up the rankings. It’s less impressive on battery life, though, and its performance falls behind the Moto G. It also doesn’t have that phone’s unique splash-proof case.

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Sony Xperia L
£120 (PAYG)

Of the two Sony phones we’ve reviewed in this group test, the Xperia L is better. It was significantly more expensive than the Xperia M when launched, but discounting has seen their prices draw closer together. The Xperia L’s build quality is more robust and the design is, in our opinion, more attractive, with a concave rubbery rear that sits comfortably in the hand.

The Xperia L has a large 4.3in display that looks crisp and clear. It runs Android 4.2 with Sony’s own skin layered on the top. It has 8GB of storage and an microSD slot so you can add more. There’s also a user-replaceable 1,700mAh battery and an 8-megapixel camera capable of recording 720p video.

Inside there’s a 1GHz dual-core Qualcomm Snapdragon S4 Plus processor, accompanied by an Adreno 305 graphics chip. This pushed it to joint first in our GFXBench T-Rex HD test, where it managed 15fps alongside the Samsung Galaxy Ace 3. However, it has a slower processor speed and fewer cores than the Moto G, which explains why it doesn’t do so well in the SunSpider test. The display is the phone’s weakest point, with the lowest maximum brightness of any of the phones we tested, at 315cd/m². The contrast of 768:1 ensures that images have plenty of punch and solidity, though. The camera is really good, particularly in low light, which challenged all of the other cameras here.

Its battery life isn’t bad, draining at a rate of 22 percent per hour when playing demanding games, 23 percent per hour when playing back 720p video, and seven percent per hour when streaming audio over 3G. This put it in fourth place amongst those we tested when the scores were averaged out.

**OUR VERDICT**
The Xperia L is a solid performer at a reasonable price, without any serious weaknesses. If you want a decent camera, expandable memory, fast performance and good build quality, it’s well worth considering. However, the Moto G has a much better screen and performs better in non-gaming apps.
LG Optimus L5 II
£109.97 (SIM-free)

www.laptopsdirect.co.uk

The LG Optimus L5 II is the most compact and lightweight phone in this group. It's 9.7mm at its thickest point and only weighs 103g.

It has a 4in 480 x 800 pixel IPS screen that's bright and clear. Performance isn't great. Its single-core processor struggles with anything demanding, like playing games or multitasking. Battery life is the L5's best quality. It consumed an average of 12 percent per hour in our tests, which puts it at the top of our table.

OUR VERDICT
The LG Optimus L5 II is likable for its compact size and battery life, but it's let down by its performance and a poor camera. Other phones are just as cheap but perform much better.

Sony Xperia M
£90 (PAYG)

www.dialaphone.co.uk

The Sony Xperia M doesn't share the Xperia L's build quality. It's small and light, but it feels flimsy and insubstantial.

The 4in display is bright but has a flat, washed-out look. There's no 4G, only 4GB of storage (though it has a microSD slot) and no extras like NFC or splash resistance. Its camera produced disappointing pictures and video in our tests. It came third in the GFXBench T-Rex HD test with 12fps, so is promising for playing games, but it fell to fifth place in our SunSpider test. For battery life, the Xperia M came joint third.

OUR VERDICT
A disappointing phone that looks and feels cheap. The display is underwhelming and the camera is awful. Performance and battery life are above average, but that's all it has going for it.

Acer Liquid E2
£149 (SIM-free)

www.pixmania.co.uk

Acer's Liquid E2 isn't the most attractive phone in this test, with circular metal grilles on the rear and a white screen surround that give it a cheap look.

Its 4.5in IPS display has a resolution of 540 x 960 pixels, which is the better than most of the phones here. Its 4GB of storage is frugal but you can boost it with the microSD memory card slot. There's also an 8-megapixel camera and a quad-core processor.

Performance is good, though the screen isn't bright enough.

OUR VERDICT
The Acer Liquid E2 is a competent smartphone with good battery life. But it's ugly, sluggish at games and more expensive than other phones that have superior specifications.

LG Optimus L7 II
£155 (SIM-free)

www.laptopsdirect.co.uk

The LG Optimus L7 II weighs 118g and looks very smart, with a fake metal rear. It has an 8-megapixel camera and its 4GB storage can be upgraded via microSD.

The best thing about the L7 is its screen. Brightness is a bit disappointing but its contrast of 908:1 helped overcome that weakness.

Both performance and battery life are a problem, though, with poor test scores in both areas putting it well below average.

OUR VERDICT
The LG Optimus L7 II isn't a terrible phone, with a reasonable screen and compact size. However, it's more expensive than the Moto G, which outclasses it across the board.
HTC Desire 500
£178

For a phone that costs less than £200, the HTC Desire 500 is unusually good-looking. It's slim, too, at 9.9mm, and only weighs 123g.

The 4.3in screen is bright but low-res (480 x 800 pixels), and the phone falls behind in performance. Its Qualcomm Snapdragon 200 processor couldn't get it out of the bottom half of the tables in any of our performance tests. It also uses more battery - in our tests it drained faster than any of the other phones reviewed.

OUR VERDICT
This is one of the most expensive phones in our test. It looks like it ought to be, with a classy design, but the performance of the phone doesn't live up to its sleek looks. In fact, it performed well below average in most of our tests.

ARCHOS 45 Titaniun
£130 (SIM-free)

The Archos 45 Titanium has the worst screen in our group test, with poor viewing angles and high reflectivity.
Performance is beyond sluggish. In fact, it's so poor, it couldn't even run the GFXBench T-Rex HD test, making it next to useless as a gaming phone. The video playback test ate its battery at 28 percent per hour, easily the worst of all the phones in this group.

OUR VERDICT
If the terrible screen on this phone isn't enough to put you off, then its poor performance and rapidly disappearing battery life should be enough to seal its fate.
## Group test results - the top 5

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Winner</th>
<th>Recommended</th>
<th>Recommended</th>
<th>Recommended</th>
<th>Sony</th>
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## Verdict

Motorola's Moto G has turned the whole concept of what makes a budget smartphone upside down. With this model, you get a great screen, a good performance and a solid, splash-proof build, all in a handset that you can buy contract-free for £100. Because it's such a great phone at a fantastic price, we've made it the winner of this group test.

There are still some compromises to be made with the Moto G, though, and if you're willing to pay a little more for certain additional features, the Samsung Galaxy Ace 3 is fantastic for the price. It trumps the Moto G with 4G, NFC, a microSD storage expansion slot and improved performance, but you have to pay almost half as much again to get it.

Also recommended is the Alcatel Onetouch Idol S, a superb handset that matches the Motorola Moto G almost all the way. Its slimmer design, larger display, 4G connection and microSD slot give it an edge, but its battery life isn't as good and its performance falls behind the Moto G.
The Definitive Guide to Android

Android tablet reviews
WE TEST AND RATE THE LATEST ANDROID TABLETS TO HELP YOU DECIDE WHICH ONE IS BEST FOR YOU

Acer Iconia B1-710
The cheapest big-name Android tablet we’ve seen

With the exception of the Amazon Kindle Fire HDX (see review, opposite) and the Asus Nexus 7 (page 32), many cheap Android tablets are utterly dire, suffering from abysmal performance and build quality. We were expecting more of the same with the Acer Iconia B1-710, a big-name 7in Android tablet.

The B1-710 isn’t a complete washout, at least when it comes to performance. Its 1.2GHz MediaTek dual-core processor proved to be fairly unexceptional in our app and webpage-loading benchmark tests, but it coped fine with basic tasks, such as web browsing and checking email. However, it’s much less suitable for playing games with demanding graphics. It also struggled when panning and scrolling through complex webpages and Google Maps, and was also sluggish launching games and other complex apps.

Battery life when playing videos continuously was disappointing at five and a half hours – one of the shortest times we’ve seen for a tablet or smartphone. This means it’s likely to run out of battery when you need it most. Build quality is another area where Acer has cut corners to keep the price low. The plastic construction feels creaky and the insecure flap covering the microSD card slot feels flimsy. It’s almost twice as thick as the latest Asus Nexus 7, but it has a thick black bezel around the screen which makes it easy to hold.

The screen is low resolution (1024 x 600 pixels) which makes text look fuzzy. Worse still, it’s not particularly bright, it looks grainy, and images have a distinctly blue tint. We weren’t expecting a high resolution screen at this price, but the dismal image quality is a letdown.

The only camera is forward-facing and it’s in an odd position. When the tablet is held vertically, the camera lens is in the top-right corner. This awkward placement means your image will appear off-centre to the other caller. You’ll also have to resist looking at the lens, otherwise you won’t make eye contact with your caller. The camera’s image quality is also bad, with fuzzy details, poor exposure and inaccurate colours. The Iconia B1-710 is a basic tablet that’s badly designed with shoddy build quality. It’s alright for use as a kid’s tablet or for light web browsing and email tasks. Otherwise it’s too flawed to recommend – if you want a quality tablet on a budget, it’s worth saving up for the far better Asus Nexus 7 or Amazon Kindle Fire HD.

Price: £90
From: www.snipca.com/10006
Verdict: It’s very cheap, but you get what you pay for – which isn’t a lot.
Rating: 2/5
Specifications
7in 1024x600-pixel screen • 1.2GHz MediaTek 8317T dual-core processor • 1GB memory • 8GB storage • Android 4.1 Jelly Bean • 340g • 12x129x197mm (HxWxD) • one-year warranty, Part Code NT.L1NEK.001 www.snipca.com/10067
Amazon Kindle Fire HDX 8.9in

Amazon's big-screen tablet is lighter than ever, but also more expensive

The Kindle Fire HDX 8.9in is Amazon's biggest tablet yet, and it's also the company's most expensive. While the Kindle Fire HDX 7in costs just £199 for the basic 16GB Wi-Fi-only version, its 8.9in counterpart costs £329. The older model is now available for just £179.

However, the HDX 8.9in is a significant step forward from its predecessor. At just 374g, it's 193g lighter than the original and almost 100g lighter than the 10in iPad Air. In fact, this is similar in weight to a 7in tablet. The lighter feel is immediately noticeable and means using it for long periods of time is a pleasure.

The trade-off for less weight is build quality - the black plastic casing isn't as sturdy as the original HD 8.9 or the HDX 7in. It creaks and bends under pressure more than we'd like, too. The plastic rear is somewhat slippery to the touch, but the angled edges and thick border around the screen make up for this, giving your fingertips some much-needed grip.

Another big improvement on its predecessor is the ultra-high-resolution 2560 x 1600-pixel screen, exceeding the 1080p resolution of its predecessor by some distance. It's very bright with exceedingly sharp text, while images are vivid with accurate colours. In short, it looks glorious. Battery life is also superb at just over 16 hours, which beats many 10in tablets.

The HDX 8.9in is the first Kindle Fire to have a rear-facing camera, but photos are blighted by noise. It's only worth using if you don't have any other camera to hand, or for use in video chats. Like other Kindle Fires, the HDX 8.9in uses Amazon's own Android-based operating system, called FireOS. If you've previously bought digital content from Amazon, you'll see all your ebooks, movies and MP3s ready to stream or download to your new device once you sign in.

One of the best aspects of FireOS is something called Mayday. This very useful feature connects you to one of Amazon's technical-support advisors via live video chat.

Other highlights include Quiet Time, which silences all notifications, so you can read in peace. Parents will appreciate the FreeTime feature, which lets you set up special accounts for your kids and specify which apps they can use or disable their ability to make purchases. This level of control is more comprehensive than the equivalent feature on the Asus Nexus 7.

Overall, the Kindle Fire HDX 8.9in is a great tablet, particularly if you're new to tablets or have kids.

Price: £329
(16GB Wi-Fi-only with adverts)
From: www.snipca.com/10960

Verdict: An excellent tablet with a great screen, long battery life and some neat software features

Rating: 5/5

Specifications
8.9in 1920x1080-pixel touchscreen • 2.3GHz Qualcomm Snapdragon 800 quad-core processor • 2GB memory • 16GB storage • Adreno 330 graphics chip • FireOS 3.0 • 374g • 231x158x8mm (HxWxD) • One-year warranty www.snipca.com/10960
Asus Nexus 7

2013

Google's budget Android tablet gets even better

The original 2012 Asus Nexus 7, made in partnership with Google, was a significant step forward for Android tablets. Despite its remarkably low price (£159 for the 16GB version), its quality design put other, more expensive Android tablets to shame. The Nexus 7 has now been updated and, while it's more expensive at £199 and has a few niggles, it's better than ever.

Sharpest screen we've ever seen

Apart from the 'Nexus' logo on the back of the tablet (now orientated vertically rather than horizontally), there initially appears little to distinguish this Nexus 7 from its predecessor. But on closer inspection, the plastic build is noticeably thinner and less creaky than before, while the dimpled rear finish of the older model has been replaced by a smooth rubbery surface. It's still a little slippery though.

Annoyingly, the volume and power buttons are hard to find by feel alone and don't give enough feedback when pressed. Another design quirk is the continued absence of an SD card slot.

It would be wise to buy the 32GB model, which costs £329, if you plan to carry lots of media files and games around. Otherwise you'll have to use online storage or juggle apps and files constantly.

Another irritant is the tablet's very thin borders on either side of the screen when it's held vertically. If you prefer to hold the device with your thumbs resting on the border, rather than gripping it like a phone, then you'll frequently find yourself tapping one of the onscreen controls by accident. It's an annoyance that would have been avoided if the Nexus had bigger borders or a touchscreen that's smart enough to realise when you've accidentally grazed it.

The Nexus 7's best new feature is its high-resolution screen. At 1920 x 1200 pixels, it's easily the sharpest of any 7in or 8in tablet screen we've seen so far. Text is exceptionally crisp, while photos and videos look vibrant and rich. The screen is almost painfully bright at its highest brightness setting, so it's more than good enough when turned down halfway to conserve power consumption.

Battery life was one of the original Nexus 7's few weaknesses. Rival mini tablets easily surpassed its so-so battery life (seven hours when playing videos continuously). The new model is much better, lasting 10 hours and 38 minutes. This is still behind the Amazon Kindle Fire HD and the cheaper iPad Mini, which last for 11 and 12 hours respectively, but neither has a screen as good as the Nexus 7's.

The first Nexus 7 only had a front-facing camera for use when making video calls, but the new model also has a five-megapixel, rear-facing camera. It's not good enough for regular use as your main camera, however. In our tests, photos weren't very sharp and suffered from lots of noise, even in brightly lit conditions. It's best used for giving video callers a view of your surroundings or companions.

We'd have forgiven the Nexus 7 for a less-than-perfect performance given its low price, but its quad-core 1.5GHz Snapdragon S4 processor and 2GB of...
Outwardly it looks similar to the original Nexus 7, but the new model improves in almost every area. Memory sped through our benchmark tests. The Nexus 7 is more than fast enough for playing the latest 3D games. In everyday use, we only occasionally encountered lag and stuttering when navigating the interface and apps.

Get new Android versions early
One of the best things about the Nexus is that you’ll get new versions of Android quickly. With other Android tablets you’ll have to wait weeks or even months for updates and some models will never get updated at all. New Android versions – including the current 4.4 KitKat – often include security patches as well as new features. Having said that, the Android version included with the Nexus 7 – 4.3 Jelly Bean – is only a minor upgrade over 4.2. However, there’s one handy new feature parents will appreciate, which is that you can now create a restricted account for kids, choosing which apps they can access. It’s not a complete child-control package. You can’t create a list of websites they’re allowed to visit, for example, but it’s still a useful feature to have. This builds on the user accounts feature introduced in 4.2, which let different members of your household have their own separate set of apps and files protected with a personal password.

One flaw with the Nexus 7, and indeed all other Android tablets, is the continuing lack of apps designed for large, high-resolution tablet screens. The number and quality of Android tablet apps is slowly improving, but the iPad still has a better selection.

Conclusion
The new Nexus 7 isn’t perfect, but its design is mostly blighted by niggling limitations rather than serious flaws. Overall it’s an excellent value tablet, but if you’re keen on downloading apps and enjoying media files, you’re better off skipping the £99 16GB model and paying £140 extra for the 32GB model.

If you want a compact tablet for tasks such as web browsing, watching video and reading ebooks, it’s the ideal device.

“Overall, the new Nexus 7 is an excellent value tablet device.”

Price: £329
From: www.snipca.com/9993

Verdict: Not quite as cheap as its predecessor, but this tablet is still a fantastic bargain - it’s easily the best Android mini tablet available.

Rating: 5/5

Specifications
7in 1920x1200-pixel screen • 1.5GHz Qualcomm Snapdragon S4 Pro quad-core processor • 2GB memory • 16GB storage • 400MHz Adreno 320 graphics chip • Android 4.3 Jelly Bean • 290g • 200x114x9mm (HxWxD) • one-year war-

The Old and New Nexus 7 at a Glance

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Asus MeMo Pad 8

A close relative of the Nexus 7, but this Android mini tablet is something of an oddity.

We had high hopes for Asus's new 8in tablet because the company also makes Google's cracking Nexus 7 tablet (see our review, page 32). But, while it does have its charms, the MeMo Pad 8 is just not as good as its more famous cousin.

The MeMo Pad 8 is thicker and more curvaceous than the Nexus 7. Throw in an easy-to-grip surface, and this tablet is more comfortable to hold than the thinner Nexus, despite narrow borders on each side of the screen (when held in portrait mode). Another difference is that the MeMo Pad has a microSD card slot useful for supplementing the built-in 16GB of storage or for downloading photos from a camera.

Although its screen is an inch bigger than the Nexus's, it actually has a lower resolution - 1280 x 800 pixels instead of 1920 x 1200. Text is, therefore, noticeably fuzzier, so reading is a bigger strain on the eyes. It’s still very bright, though, with reasonably good colour accuracy and contrast, although the Nexus’s screen is even better in these areas too.

The MeMo Pad’s 1.6GHz quad-core processor didn’t excel in our demanding webpage-loading and 3D graphics benchmark tests, but it’s still reasonably fast at launching and running complex apps. The touchscreen’s responsiveness was generally very good, tracking our finger swipes and prods accurately and quickly. The exception to this was when we activated Asus’s power-saving mode, which drastically reduced the responsiveness of the touchscreen to the point where it was infuriatingly unusable.

This is a shame because the power-saving mode does actually work. With it switched off, the battery lasted 10 hours 16 minutes in our tests - which is good for a mini tablet. With power-saving mode on, another two and a half hours were added. But given the excruciating lack of responsiveness it causes, we’d suggest avoiding it unless you really need every last drop of battery life. Annoyingly, the power-saving mode randomly turns itself on, even after you’ve deactivated it.

Asus hasn’t radically altered the 'stock' Android 4.3 operating system. Some useful apps have been added, such as a basic file manager and a handy parental lock app. The latter lets you determine which apps your kids can use and also remotely track and disable the tablet if it gets lost or stolen, as long as it's connected to the internet.

The Asus MeMo Pad 8 is a good Android mini tablet, but unless you really want a microSD card slot, the Nexus 7 is far better value. Its higher-resolution screen, fast performance and smooth responsiveness, as well as a guarantee of future Android system updates, make it well worth the extra £20.

Price: £180
From: www.snipca.com/11637
Verdict: A good mini tablet, but for most the Nexus 7 is a far better buy

Rating: 4/5
Specifications
- 8in 1280x800-pixel touchscreen
- 1.6GHz quadcore processor
- 1GB memory
- 16GB storage
- Mali 400 graphics chip
- Android 4.3 Jelly Bean
- 350g
- 213x127x10mm
- One-year warranty www.snipca.com/11638
Kobo Arc 10 HD

A keenly priced 10in Android tablet

Kobo is best known for its range of e-readers, but the company also makes Android tablets. Its latest model is the Arc 10 HD which, despite its relatively low price of just £299, has a very high-resolution screen. At 2560 x 1600 pixels, the resolution is higher than that of the iPad Air and matches that of the Samsung Nexus 10.

Thanks to its high resolution, text looks sharp, but colours look a little washed out and contrast is mediocre – especially when compared to the iPad Air. Turning off Kobo’s custom display settings compensates for these faults to an extent, but at the cost of revealing another: a noticeable blue tint. The responsiveness of the touchscreen is also flawed. At times during our test it was overly sensitive, mistaking the lightest of touches as screen presses. At other times, it was too laggy.

However, the Arc 10 HD is very fast at running apps. The 1.8 GHz Nvidia Tegra 4 quad-core processor and 2GB of memory excelled in our benchmark tests, loading detailed 3D graphics and complex webpages with ease. Less impressive was the battery life. At just over nine hours when playing videos continuously, it’s shorter than other 10in tablets we’ve seen.

There are several smaller flaws which aren’t too bad on their own, but when taken together make using the Arc 10 HD more clunky than other 10in tablets. There’s no SD card slot for adding more storage to the existing 16GB. There isn’t a rear-facing camera, but there is a forward-facing camera for video chats. Footage was of a poor quality, though, with lots of noise. The Arc 10 HD weighs 690g which is noticeably heavier than the 470g iPad Air – the latter is far more comfortable to hold and use for long periods. The oddly angular design of the tablet’s rear doesn’t help either, but it did give our fingers more grip on the slippery rear.

The customised Android interface is a mixed bag. The first home screen is an attractive tiled view of all the ebooks, magazines and other content bought from Kobo’s store, with occasional pop-ups suggesting similar items you may like. The second is a standard Android home screen for your apps, but oddly you can’t organise apps into folders. Instead you can group them into a large virtual binder with a named spine visible on a virtual bookshelf on a separate home screen. You can organise all your content this way, mixing and matching different types of content such as ebooks, apps and photos in the same binder. It’s not a bad idea, but the virtual bookshelf wastes a lot of screen space.

The Kobo Arc 10 HD looks like a great budget tablet on paper, but numerous flaws make it a merely average one in reality.
Samsung Galaxy Note 10.1
2014 Edition

A 10in tablet you can draw on

The Galaxy Note 10.1 2014 Edition, a smaller, lighter, cheaper version of Samsung's huge Galaxy NotePro 12.2. It comes with its own stylus for drawing and writing on screen.

The Note 10.1 is slender yet comfortable to hold. The back has a faux-leather plastic finish complete with fake stitching. It won't be to everyone's tastes and, compared to the sleek metal of the iPad, it feels a bit cheap.

The screen has a resolution of 2560 x 1600 pixels. It is exceptionally bright with vibrant colours and crisp text, so it's great both for reading and for watching HD films and TV shows. Our biggest gripe with Android tablets is how few apps are developed specifically for their large screens. While it might appear that Samsung has tried to remedy this problem with its own suite of apps, most of them serve little purpose.

The included stylus is woefully under-exploited. The S Pen - as it's known - is both precise and sensitive, making it a great tool for budding and professional artists and designers. It is stored in a small nook in the top-right corner of the tablet with a menu appearing once you remove it. This menu provides easy access to the included apps designed for use with the stylus, including a note-taking app, a scrapbook app and an app that lets you annotate a screenshot of whatever is on your screen.

Unfortunately, most of these apps are underwhelming. SketchBook for Galaxy is the exception with its range of sophisticated tools for easily creating stunning works of art. A wide range of brushes are available and artworks can have multiple layers too. By drawing straight on the screen - rather than using a mouse or graphics tablet as you would on a PC - you can sketch quickly and accurately. More apps like this are needed if the stylus is to realise its full potential.

The Note 10.1 runs Android 4.3 Jelly Bean and is one of the fastest tablets we've seen, scoring top marks in our 3D graphics and webpage-loading tests. It handled everything we threw at it with ease thanks to its large 3GB of memory and its unusual eight-core processor which is actually a pair of quad-core processors that work together.

The main 1.6GHz quad-core processor uses the latest technology, so it handles complex, demanding apps, while a slower and older, but more power-efficient 1.3GHz quad-core processor takes on less intensive tasks to help prolong battery life. Battery life was okay at just under nine hours. If the included 32GB of storage space isn't enough, there's a microSD card slot for adding more.

The cameras on the Note 10.1 are fair to middling at best. The front-facing two-megapixel camera is fine for Skype video calls, but the eight-megapixel camera on the back is prone to wildly over-saturating images and mucking up contrast in anything other than ideal lighting conditions.

The Note 10.1 2014 Edition is let down by its cheap build quality. But it's the best 10in Android tablet currently available, especially if you're a keen, budding artist. If you don't need a big screen or a stylus, though, the Amazon Kindle Fire HDX 8.9 (see page 31) is much better value.

Price: £410
From: www.snipca.com/12111

Verdict: A fast tablet with an excellent screen, but it feels cheap and there aren't enough apps for the stylus.

Rating: 4/5

Specifications:
10.1in 2560x1600-pixel touchscreen • Samsung Exynos Octa 5420 eight-core processor • 3GB memory • 32GB storage • Android 4.3 Jelly Bean • 540g • 243x171x8mm (HxWxD) • One-year warranty www.snipca.com/11643
Samsung Galaxy TabPro 8.4

Samsung’s newest mini tablet isn’t a knockout

Samsung has a dizzying array of tablets available and one of the company’s latest models is the Galaxy TabPro 8.4. From the front it resembles the iPad Mini, but turn it over and it couldn’t be more different. Instead of metal, there’s a hard plastic rear designed to look like leather, complete with fake stitching. It looks tacky, especially in white.

While we’re not fond of its appearance, the TabPro 8.4 is light at 331g. It’s reasonably sturdy too, although the plastic build does bend and creak under pressure more than we’d like. The 8.4 apes the iPad Mini by having very narrow edges on the left- and right-hand sides of the screen (when held in portrait orientation). This makes it tricky to get a comfortable hold on the tablet without accidentally pressing something onscreen. The iPad Mini partially gets around this with thumb-rejection technology that tries to tell the difference between when you’re pressing something onscreen and when you’re simply resting your thumb. It doesn’t always work, but it’s better than nothing and the 8.4 has nothing similar.

At least the screen itself looks great. The 8.4in screen is exceptionally bright and has a very high resolution of 2560 x 1600 pixels, which lets you see fine details in high-resolution photos. Text is also very sharp.

Disappointingly, the 8.4 managed only eight and a half hours in our battery test. Although still a respectable score, this lags behind the Nexus 7, which lasted 10 and a half hours in our tests. One feature the Nexus 7 doesn’t have that the 8.4 does, however, is a micro SD slot for boosting the built-in 16GB of storage.

The 8.4 is very fast and responsive. The 2.3GHz Qualcomm Snapdragon 800 quad-core processor blitzes its way through our benchmarks and we never noticed any juddering, whether browsing complex websites or flicking through the Android interface.

The 8.4 runs Android 4.4 KitKat, the latest version of Google’s operating system, but it’s been modified by Samsung - often in odd ways. Inexplicably, Samsung has removed the dock at the bottom of the home screen for holding your most frequently used apps, and disabled the ability to have multiple user accounts.

Many of Samsung’s additions are of limited value. There’s a large widget that shows your upcoming appointments and new emails, but it doesn’t work with Gmail. The Smart Stay feature is supposed to use the front-facing camera to track your eyes so the tablet never goes to sleep when you’re reading, but this often didn’t work unless we stared directly at the camera, limiting its usefulness.

Like other Samsung tablets, the 8.4 can run more than two apps on the screen at the same time. However, while those other tablets automatically arrange the apps side by side, on the 8.4 apps appear in floating windows and it’s up to you to resize them. Although this is more flexible, it’s also more fiddly, as the small window borders make resizing a little tricky and it’s too easy to accidentally distort the appearance of the app by dragging the borders too far or too narrow in either direction. Plus, not all apps work with this feature. This potentially useful function needs refining. Even then it would work best on a join screen or larger.

Despite the questionable usefulness of Samsung’s changes to Android and the merely satisfactory battery life, the TabPro 8.4 is still a reasonably good tablet. However, unless you really want a micro SD slot we’d much rather have the Asus Nexus 7.

### Price:
£330
(16GB, Wi-Fi only)
FROM: www.snipca.com/12024

### Verdict:
More expensive than the Asus Nexus 7, but not as well-made as the iPad Mini 2 - the TabPro 8.4 is an awkward, imperfect tablet.

### RATING:
3/5

### Specifications:
- 8.4in 2560x1600 pixel touchscreen
- 2.3GHz Qualcomm Snapdragon 800 quad-core processor
- 2GB memory
- 16GB storage
- Adreno 330 graphics chip
- Android 4.4 KitKat
- 331g
- 219x129x7mm (HxWxD)
- One-year warranty www.snipca.com/12025
Tesco Hudl

Is Tesco’s bargain-basement Android tablet great value or cheap and nasty?

Plenty of big-name electronics manufacturers have tried making cheap Android tablets and failed miserably. So we were sceptical that Tesco could do any better with the Hudl, a 7in Android tablet that costs just £119 – or under £100 if you have enough Clubcard points.

Despite its low price, the Hudl feels surprisingly well made. The plastic build is sturdy and rigid with a thick border around the screen making it easy to hold.

The Hudl is available in purple, blue, black or red and the coloured rear looks attractive, although it does also feel a little slippery. It is light at 370g, although the Asus Nexus 7 is even lighter (see our review, page 32).

Another pleasant surprise is the 7in screen which has a remarkably high resolution for a budget tablet at 1440 x 900 pixels. It’s not as crisp as the 1080p screen on the Nexus 7, but it is bright with good colour accuracy and contrast. You can hook up a TV through the micro HDMI port as well as boost the 16GB of storage using microSD cards.

The Hudl has both rear and forward facing cameras, but picture and video quality of both is poor. Battery life isn’t bad, however. It lasted nine hours when playing videos continuously. This lags behind other, more expensive mini tablets, but is still decent. You’ll need headphones when watching films because the built-in speakers are very tinny.

Tesco hasn’t drastically altered the Android 4.2 interface, but we’d like to have seen Android 4.3 pre-installed because you can create accounts for children that let you control which apps they can use. Tesco has added a couple of apps and widgets for its own services. If you buy your groceries online from Tesco, a widget tells you when your next delivery is due, while another shows your Clubcard points balance. Usefully for tablet novices, a surprisingly well-written Getting Started app has lots of illustrated instructions, interactive tutorials and app recommendations.

As expected, apps for the Tesco-owned Blinkbox film-rental and music-downloading service are pre-installed. An unexpected extra is the Clubcard TV app. Once you’ve signed up with your personal details and Clubcard number you can watch a selection of streamed films and TV shows for free. Don’t get too excited, though – the ad-supported service is currently dominated by low-budget B-movies and various TV shows. Oddly, the TV shows aren’t always available in complete series.

The Hudl’s biggest flaws are performance and responsiveness. Even though it has a 1.5GHz quad-core processor and 1GB of memory, loading and scrolling through complex websites, running multiple apps simultaneously and playing demanding games was often slow. The touchscreen was often infuriatingly unresponsive, with a noticeable delay before our finger presses were recognised. Although the Hudl’s performance and responsiveness are poor – especially compared to the Nexus 7 or the Kindle Fire HDX – it’s still better than all the budget tablets made by obscure companies.

Tesco has got some things right with the Hudl, but that just makes its flaws all the more glaring. The screen and build quality are very good, but the performance and responsiveness are poor. The Hudl is only worth buying if you’re on very tight budget and have very basic computing needs or if you just want a cheap tablet for the kids.

Price: £119
From: www.tesco.com/hudl

Verdict: A potentially great tablet marred by some substandard design flaws.

Rating: 3/5

Specifications:
7in 1440x900 pixel screen • 1.5GHz quad-core processor • 1GB memory • 16GB storage • Mali 400 graphics chip • Android 4.2 Jelly Bean • 370g, 129x193x10mm (HxWxD) • One-year warranty www.tesco.com/hudl
Wikipad

An Android tablet that doubles up as a games console

The Wikipad is a 7in Android tablet with a difference. In no way related to Wikipedia, the Wikipad comes with a game-controller accessory that docks securely with the tablet via the micro USB port, cradling it nice and snugly. This lets you play games that would otherwise be cumbersome to play using just the touchscreen.

When docked, the Wikipad balloons from 300g to 650g, which is approximately the weight of a 10in iPad. It also adds significant bulk, so you’re not likely to take the fully docked Wikipad out and about too often. The controller adds two control sticks, four trigger buttons and several other buttons. The control sticks and buttons feel responsive and are well designed. When you play fast-paced action games, they are much easier to use than the virtual onscreen sticks and buttons such games normally rely on.

The list of games you can play using the controller (www.wikipad.com/games) is surprisingly long. And since the product’s initial release, the company has issued an app that lets you program the controller to work with other games too.

3D graphics look great thanks to the fast quad-core 1.2GHz Nvidia Tegra 3 processor and its dedicated graphics chip. However, other tablets such as the new Nexus 7 have even faster processors and graphics chips, and will therefore play the very latest titles more smoothly.

The Wikipad feels a little dated and underpowered in other ways. The 1280 x 800-pixel screen is bright and sharp, but the 1080p screen of the Nexus 7 is even brighter and sharper. You’ll want to use headphones when playing games, movies or music, because the built-in speakers are very tinny.

The Wikipad uses Android 4.2 and comes with no interface embellishments or additions. However, Android 4.3 has support for more detailed 3D graphics – an important feature on a gaming tablet. The company has promised the Wikipad will receive the Android 4.3 update.

These omissions and flaws are disappointing for a gaming tablet, but as a general-purpose tablet the Wikipad is a pleasure to use. The borders around the screen and the raised ridge on the back make it comfortable to hold. Performance when browsing the web and using apps is smooth and slick, with only occasional stuttering and lag.

The battery lasted nine hours when playing videos continuously. This isn’t as long as other similar-sized tablets, but it’s still respectable.

There’s no rear-facing camera, though there is a forward-facing camera for making video calls – you’ll need plenty of light though, because video footage tends to be rather dark. 16GB of built-in storage is provided, while a microSD card slot lets you add more storage – essential if you’re installing lots of games and media files.

The Wikipad isn’t a bad device and it’s cheaper than buying a separate tablet and portable games console, such as the Nintendo 3DS, but it’s not as good as either. Other tablets are better for general-purpose use, and portable games consoles have more games.

Price: £250
FROM: www.wikipad.com

Verdict: A handy idea, but the controller is huge and cumbersome, while the specifications are already a little dated for a gaming tablet.

RATING: 3/5

Specifications
7in 1280x800 pixel screen • 1.2GHz Nvidia Tegra quad-core processor • 1GB memory • 16GB storage • Nvidia 12-core ULP graphics chip • Android 4.2 Jelly Bean • 300g (650g with controller) • 126x196x10mm (HxWxD) • 145x26x66mm (HxWxD) with controller, one-year warranty www.wikipad.com
Chapter 3
Great apps & tools

With Android, the device itself is only half the story. In this chapter we explore all the amazing apps you need to install.

So you’ve got your shiny new Android phone or tablet. Now what? Well, there’s an easy answer to that – head directly to the Google Play store and get downloading. The tools and apps you’ll find there can unlock unbelievable functions and turn your Android device into a mobile office, a handheld games console and more besides. Better still, many apps are free too. The trouble is that there are so many of them, it’s often difficult to know where to start. That’s why we’ve filtered out the chaff and selected the ultimate toolkit for your device, whether you’re using a phone or you’re looking for apps designed for tablet screens.

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Cut through the Flappy Bird clones and get to some games that are worth playing.
Get the best apps for your device

Learn how adding apps can make your phone or tablet even more useful.

Android devices can be used for much more than just making phone calls and sending text messages - they're also versatile pocket-sized computers. The key to this flexibility is apps.

Unlike software on computers, which can be pricey and fiddly for novices to install, most Android apps are cheap or even free and often take just seconds to install too. Over the next two pages we will give you an overview of everything you need to know about the world of Android apps - what they are, examples of some of the best apps available, where to get them for free and more.

Apps and widgets explained
Everything an Android device can do out of the box, from making calls to sending texts and looking up directions in Google Maps, is done by apps so, even if you’ve never thought about them before, you have already used many. Like programs on your PC, there is a wide variety of apps available for Android.

Apps fill your device’s screen while in use. You might also have widgets on your device. These sit on your home screen and perform a task, such as show the weather or the date of your next appointment. Others enhance how existing apps work, such as on-screen keyboards that replace the one that came on your phone with one that has bigger keys for example.

Most apps are inexpensive, costing only a couple of pounds at most, while many are free. It would take a whole separate guide to list all our favourite apps, but we’ve listed some of the best apps around in the rest of this chapter and we’ll use a few examples here to explain how apps can be put to good use.

Apps for everything
Some of the most useful apps are those for use while out and about. You could use the National Rail Enquiries app to keep tabs on departure times and disruptions to train services, for example, or use Yelp to help you find a good restaurant nearby.

Games are among the most popular apps, with many available, ranging from violent shooters, like Call of Duty to physics-based puzzle games, such as Angry Birds. Word games such as the Scrabble-like Words with Friends and Wordfeud and more traditional games such as Chess Free are also fun.
There are other ways to stay entertained besides games. Spotify lets you listen to your choice of music from a selection of hundreds of thousands of tracks, while BBC iPlayer lets you catch up with any TV shows you may have missed and the Amazon Kindle app lets you read your favourite books. You can find out more about all this in the Entertainment chapter of this guide, starting on page 92.

Apps can keep you up to date with the latest headlines (BBC News) or even save you money. The Skype app can be used to make free phone calls to other Skype users, or to landline and mobile phones at reduced rates, for example.

Getting apps
Unlike PC software, Android apps can’t be bought in high street shops. Instead, they are downloaded over the internet using an online app store. The most popular Android app store is the official Google Play store, previously called Android Market. The Google Play app is pre-installed on almost all new Android phones and tablets. Google Play also sells music, ebooks, magazines and movies.

Finding apps in Google Play is easy. Besides those promoted on the launch screen, apps are organised by category, such as Finance or Health and Fitness. There are also charts listing new arrivals and popular apps. You can also search apps by typing in keywords such as ‘bbc’ or ‘currency converter’.

Once you’ve found the app you want, tap the Install button and the download process will begin, deducting payment if applicable. Google Play will download new versions of your apps automatically as they become available, but you can pick and choose which updates you want if you prefer.

The Google Play app is the most obvious way to browse and download apps directly to your device, but you can use the Google Play website (https://play.google.com) from your PC too. Any purchases you make on the website will be downloaded on your phone or tablet. If you prefer to use the app, you will need to add payment details to your Google account first. You can do this at wallet.google.com.

Unlike the iPhone, which can only download apps from Apple’s Store, Android apps are available from a variety of sources. The biggest alternative to Google Play is the Amazon Appstore for Android (www.snipca.com/12280). Its main attraction is the deal of the day where a normally paid-for app is free for 24 hours.

Samsung’s Android devices come with the company’s own app store too. There’s little here that isn’t available in Google Play, but it can be a good way of finding apps that utilise features unique to Samsung’s devices, such as the stylus included with several models.

Some cheap, unbranded Android devices don’t come with Google Play, but include an independent app store instead. We would be wary of these app stores and recommend against buying most unbranded Android devices. Finally, some apps can be downloaded from their maker’s websites, but this is increasingly uncommon.

Security concerns
Apps can be very powerful and since Google, unlike Apple, doesn’t strictly vet apps submitted by developers before placing them on sale in its app store, it’s worth being cautious when installing them.

Before installing an app, Google Play shows a list of permissions. These are actions the app can perform once it’s installed on your phone or tablet, such as making calls, accessing the contents of your SD cards, finding out where you are using GPS and more. It’s worth reading this list when installing an app. For example, if a game’s Permissions include making phone calls and tracking your location via GPS, which most games wouldn’t need to do, it would be wise to investigate further before downloading the game. For more on privacy and security, turn to page 106.
The best free apps for your tablet

Put away your Android phone — some of the best apps should only be used on a tablet. We pick apps that look great on big screens.

When it comes to tasks like playing music on the go or taking a quick photo, the smartphone in your pocket is often all you need. But there are some occasions where only a tablet will do.

Whether you’re editing a document, reading an ebook or gazing at the stars, the small screen of your smartphone is likely to make the task nigh on impossible. With a larger display at your disposal, however, a whole world of opportunities suddenly opens up. You could turn your tablet into a digital sketchpad, for example, flip through a virtual magazine at your convenience, or make precise alterations to your photos.

So we’ve rounded up the best free apps that let you take full advantage of all the extra screen space your tablet provides. And we’re not talking about supersized phones (those so-called ‘phablets’). Here we will be specifically looking at apps that have been designed for — or work best on — screens that are seven inches or more in size.

Explore the Solar System in 3D

Star Chart

Android version: varies depending on device

www.snipca.com/11532

Have you ever stared at the sky on a clear night and wished you knew more about the constellations? Well, Star Chart puts all the information you need at your fingertips. This beautifully designed app harnesses the power of GPS and uses augmented reality technology (for devices with a built-in compass) to provide you with an annotated 3D view of the heavens in real time, from wherever you happen to be on the planet.

Want to know the name of a particularly bright star? Hold your tablet up towards it, identify the corresponding astral body on the star map, and tap it to discover more details — including distance from Earth, level of brightness, and which constellation it forms part of. Even more information is available for planets, including diameter, surface temperature and orbital period, all accompanied by impressive 3D animations that would be wasted on a smartphone screen.

Clever hidden features include the ability to override the GPS function and manually set your location to another city to see what the sky looks like from almost anywhere else in the world. You can also travel through time to see the skies as they looked thousands of years ago or how they will look far into the future.

The app itself is free and provides a lot of useful information as standard. Keen amateur astronomers should consider paying for the in-app packs, which add meteor showers, comets and satellites for a couple of quid each. You can also pay to extend the star catalogue, reach further into the solar system or add Messier objects (www.snipca.com/11574), such as clusters or nebulae, to the map.
**Tackle Office tasks on your tablet**

QuickOffice

**Android version:** varies depending on device  
www.snipca.com/11533

Thanks to their large displays and user-friendly onscreen keyboards, tablets are much better suited to editing documents and spreadsheets than smartphones. But a proper tablet version of Microsoft Office continues to be conspicuous by its absence from Google Play – only Windows 8 and iOS devices currently allow access to a tablet edition of Office.

Into this vacuum a number of apps have launched, most of which aren’t free. QuickOffice used to cost around £10, but last year Google bought the company who developed the app and made it available without charge.

QuickOffice lets you create and edit existing Word, Excel and PowerPoint files without having to convert them, and stores them on your tablet or in Google Drive. Wisely, it doesn’t attempt to replicate Microsoft Office’s ribbon in tablet form. Instead, it offers a dedicated set of editing tools for each of its components, accessible via icons that run along the menu bar at the top of your screen. It’s not quite the same as having a full copy of Office on your tablet, but QuickOffice provides most of the tools you’ll need for editing while on the move, including font and formatting options, the ability to save as a PDF, or print from anywhere via Google Cloud Print.

You can also use QuickOffice on a phone, but the experience isn’t great, with a cramped document view and fiddly editing.

**Stream music, films and photos from your PC**

BubbleUPnP

**Android version:** 2.1 or later  
www.snipca.com/11556

Your tablet makes for a great second screen – in other words a portable window on your PC that lets you access all the photos, videos and music stored on your computer wirelessly from anywhere in your home. Users of Apple tablets can do this by enabling Home Sharing within iTunes but Android users can download a very useful free app called BubbleUPnP, which achieves a similar effect. You’ll need to activate media sharing on your PC if you haven’t already done so.

The quickest way to do this is to open Windows Media Player, click Stream and select ‘Turn on media streaming with Homegroup’. Now you’ll be able to select your PC under Devices within BubbleUPnP and browse your PC’s contents at will. Music and photo slideshows can be played through Bubble itself, but video playback is delegated to an external media player; either your tablet’s stock video player or an alternative free app, such as MX Player (www.snipca.com/11557).

**Create your own personalised magazine**

Flipboard

**Android version:** varies depending on device  
www.snipca.com/11535

These days we get our news and views from a wide variety of sources: newspapers, websites, blogs, social networks and more. Flipboard is a way of collating all these sources and converting them into a great-looking magazine-type format. You decide where the content comes from, either by browsing available topics or by adding a website, social-media account or RSS feed. Then, every time you fire up the app, it gathers all the latest stories from your sources and presents them, complete with a cover and pages that you can swipe through with your finger.

The effect is genuinely quite stunning, with headlines about your friends’ status updates and tweets from people you follow mixed in with the latest current affairs and headlines from your favourite sites. It’s basically a tailor-made version of the web that takes full advantage of your tablet’s touchscreen.
Get a graphical view of the weather

Yahoo Weather

Android version: 2.3 or later
www.snipca.com/11552

When it comes to weather apps, you might not think it makes much difference whether you view it on a tablet or smartphone. But you'd be wrong. Yahoo's recently redesigned Weather app is a thing of beauty and looks simply stunning on a tablet screen. It finds photos that relate to your location, time of day and weather conditions, and employs them as a backdrop for a handsomely presented graphical forecast.

The information provided is highly detailed, with a 10-day forecast accessible by swiping up from the bottom of the screen. Rainfall chance, windspeed, sunrise and sunset times are all present as are animated graphics and a satellite view. Rarely has meteorology looked this good.

Send text messages from your tablet

MightyText

Android version: 3.1 or later
www.snipca.com/11558

Text messaging might seem like something you'd normally do on your phone, but recently app makers have cottoned onto the fact that it's a darn sight easier to text from a tablet, thanks to their larger on-screen keyboards. The latest version of iOS includes a Messages app that lets you send and receive texts with other iOS users for free. But if you have both an Android smartphone and tablet, then a clever app called MightyText goes one better.

Install MightyText on your tablet, then install the relevant app on your phone (from www.snipca.com/11558) and you'll be able to send and receive texts via your tablet, using your phone's number and your mobile network provider's text allowance. Every message is synced with your phone's SMS inbox. The app is uncluttered, smartly designed and easy to use. There's also a web app that lets you pull off the same trick from your PC, and you can send texts from within Gmail too.

Get free crowd-sourced maps

Waze

Android version: 2.2 or later
www.snipca.com/11539

If mapping and navigation smartphone apps have one painfully obvious Achilles’ heel, it’s that most phone screens are far too small to see the maps you're trying to view. Use one on your tablet, however, and your route ahead suddenly becomes much clearer.

The two other problems with GPS apps are cost and reliability, but Waze has a solution for both. For a start, the Google-owned app is free. Secondly, it's crowd-sourced - that means it gathers much of its information from real drivers and other Waze users. This has the effect of making things like travel times and traffic updates much more accurate than many traditional navigation apps. You can use Waze without an account but signing up for one lets you contribute to the Waze community yourself - reporting map problems or petrol prices, for example - which can be helpful for others.

4 hacks to improve your tablet’s display

1. Get an instant zoom
   On Android tablets you can switch on a hidden option that lets you get directly to some useful display settings, including a zoom setting. Tap Settings, Accessibility, then Magnification gestures. Switch this option on, then zoom anywhere by tapping the screen three times.

2. Turn off auto brightness
   Most Android tablets will automatically dim or brighten their displays, depending on the ambient light. This is useful for conserving battery power, but it can also result in a distracting flicker. To turn this setting off on your Android tablet, tap Settings, Display, Brightness, then Auto.

3. Adjust tint and contrast
   By default, most Android tablets don’t let you alter screen tint and contrast, but you can still do so by installing a free app called Screen Adjuster (www.snipca.com/11541). It also lets you dim your display more than Android normally allows.

4. Make text easier to read
   Not everyone has perfect vision. If you find the text on your Android tablet hard to see, there’s an easy fix. Tap Settings, then Accessibility and tick ‘Large text’. For more information on Android’s built-in accessibility features, turn to page 118 of this guide.
Expand your tablet’s storage

**Dropbox**

**Android version:** varies depending on device  
www.snipca.com/11546

It might seem obvious to single out Dropbox. But there are some specific reasons why it’s an essential download for tablet owners. It’s a great way to expand your device’s (often limited) internal storage. You get 2GB just for signing up and you can earn even more free space (up to 16GB) by referring friends to the service and completing a number of other simple set-up tasks. If you use Dropbox to keep backup copies of your photos, then you can view them on your tablet from wherever you are via the Dropbox app. Likewise with documents and spreadsheets. Although you can’t use Dropbox to edit your files you can use the ‘Open with...’ command to edit them in QuickOffice (see page 45) or a similar office app.

And if all that still seems obvious, then what you might not know is that it’s also possible to stream music and video over the web directly from Dropbox, letting you enjoy films and music on the go without them hogging valuable storage space on your tablet.

Turn your tablet into a sketch pad

**SketchBook Express**

**Android version:** 4 or later  
www.snipca.com/11544

Several well-known artists have started turning to their tablets for inspiration, including David Hockney, who is these days just as likely to be found painting portraits and landscapes with the free iPad app Brushes (www.snipca.com/11577) as he is with an actual brush. For Android users, we reckon you should try SketchBook Express – it’s incredibly simple to use.

Basically, you paint or draw with your finger. You can use several different brush and pen types, and the app is clever enough to simulate pressure sensitivity for realistic strokes, whether you’re ‘drawing’ in pencil or ink, or trying out a watercolour effect. You can save your work to the app’s own gallery or export them to your tablet’s photo library. The Pro version costs £3 and offers a wider selection of brushes and extended features, but the free version offers more than enough for most artistic types.

Make, sync and share notes

**Springpad**

**Android version:** varies depending on device  
www.snipca.com/11554

Springpad turns your tablet into an electronic scrapbook, letting you collect, save and share all kinds of things – films you’ve watched, recipes you’ve discovered, books you’ve read, holidays you’re planning, or just random stuff you encounter on your journey through the day.

You can add photos, web clippings, voice notes and more. Depending on your needs, Springpad can serve as anything from a handy to-do list to a kind of visual diary. You can use a number of preset notebook types, including ones that cover work, home-improvement projects or task reminders. Alternatively, there’s the option to create your own custom notebook from scratch.

Springpad works across a number of devices, including your phone and PC as well as your tablet. It syncs any changes you make, so that you can access your notebooks from anywhere and they are always the most up-to-date version. There’s an interesting social element that lets you follow other people’s notebooks or share one of your own. This is particularly handy if you’re planning an event with others or you’re a member of a club, for example. We’re big fans of the fairly similar Evernote app, but it sometimes feels like it’s aimed at business workers. Springpad is a great alternative for the average user.
Everything you need to know about Google

Ultimate guide to Google’s Hidden Tools

427 amazing new tricks you’ve never tried

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What next for tablet screens?

Despite all the wild predictions that appear on the web months ahead of every new tablet launch, it will probably be a while before we’re all using completely see-through tablets or devices that are flexible enough to roll up and stuff in a back pocket. That said, flexibility is certainly an area being explored by mobile device manufacturers – LG’s G-Flex smartphone is due out soon and has a 5-inch bendable display and semi-rigid curved body. The apparent benefits of flexible displays is that they are harder to crack or scratch, and tablets with similar designs could soon follow.

In the more immediate future, we’re likely to see higher-resolution displays with denser pixels per inch (PPI), which will help to make text smoother and colours more vivid. Apple’s latest iPad Air and iPad Mini models use Retina displays, which have a resolution of 2048 x 1536 pixels – even higher than HD televisions. And a number of Android devices, such as the latest Samsung Galaxy Note 10.1, are also beginning to offer higher resolutions and the trend is likely to continue.

We’re also likely to see a shift in the materials used to build tablet display panels. Most tablets currently use standard LCD screens, but AMOLED (active-matrix organic light-emitting diode) could become much more widely adopted. This technology, which is already found in a number of smartphones, offers smoother motion and consumes far less power. Samsung, in particular, is thought to be developing tablets with AMOLED screens.
Every free phone app you'll ever need

You probably have big-name apps on your phone, but many of the best ones aren’t easy to find. We reveal 27 brilliant free apps every Android phone should have installed.

1. Quickly dispose of junk
   Easy Uninstaller
   www.snipca.com/10893
   It’s likely that your Android phone is cluttered with apps you don’t need or want, even if you’ve only just bought it. Easy Uninstaller makes getting rid of redundant apps easy. It displays a list of everything installed on your device so you can scroll through, select all the apps you want to remove and tap Uninstall. Unfortunately, you won’t be able to remove pre-installed apps from the likes of Samsung, HTC and Sony.

2. Keep your browsing private
   Hotspot Shield VPN
   www.snipca.com/10895
   If you’re working on a public Wi-Fi network it’s important to keep your browsing private to protect yourself from hackers. Hotspot Shield VPN effectively hides your device when you connect to a Wi-Fi network. Before you connect to public Wi-Fi, open Hotspot Shield and tap ‘Protect my connection!’ Within moments the VPN will be configured, keeping you safe from any hackers loitering on the network.

3. Upgrade to a slicker interface
   Nova Launcher
   (www.snipca.com/10900)
   One of the best things about Android is how customisable it is. For proof of this check out the brilliant Nova Launcher, which is a great replacement for your default interface. Download and open Nova Launcher, then select Nova Settings and follow the instructions to set it as your default home screen. You can now adjust how Android looks and works, using transitions when opening and closing apps, and changing colour themes and the appearance of the dock at the bottom of your screen. For more on customising your Android device, turn to page 118.
4. **Link all your cloud storage**
   **CloudCube**
   [www.snipca.com/10898](http://www.snipca.com/10898)
   Using more than one cloud-storage service gives you more space, but keeping track of what you’ve stored where is a real pain. If you use Box, Dropbox, Google Drive, OneDrive or SugarSync, you can use CloudCube to link them all together in one place. Once you’ve added all your accounts you can browse, upload, download and search.

5. **Manage your phone from your PC**
   **AirDroid**
   [www.snipca.com/10899](http://www.snipca.com/10899)
   AirDroid is a brilliant app that lets you do just about anything on your Android phone from the comfort of your PC. Install the app, create an account and on your PC go to [web.airdroid.com](http://web.airdroid.com) and log in using the account details you’ve just created. You can now view and send messages, change settings, transfer files and even use your phone’s camera from your PC.

6. **Automatically control Wi-Fi and volume**
   **Silence**
   [www.snipca.com/10901](http://www.snipca.com/10901)
   Always in the office from 9 to 5? Always in bed by 11pm? You can get your phone to automatically perform tasks to match your daily routine, such as turning on Wi-Fi when you’re at work to save on data, or silencing itself when you go to bed. The app Silence can automatically control many functions, including Wi-Fi, mobile data and ringer volume – you just need to tell it what to do and when. Tap Add New Event, then ‘Create an Event from Scratch’. Enter the details, tap Next and select the ‘Toggle’, then tap Save.

7. **Only hear important calls when sleeping**
   **Nights Keeper**
   [www.snipca.com/10902](http://www.snipca.com/10902)
   While Silence is great if you never want to be disturbed when you sleep, you may still want important calls to come through. That’s where Nights Keeper comes into its own. There are default settings for weekdays and weekends, which keep your phone silent while you sleep. The Call Filtering feature is the really clever bit – letting you add certain contacts to a ‘white list’, so any calls from them will make your phone ring, while nuisance calls and wrong numbers will stay silent. The ‘Emergency call’ feature makes your phone ring only if the same number calls you three times within a short space of time.

8. **Wirelessly connect to your printer**
   **Cloud Print**
   [www.snipca.com/10907](http://www.snipca.com/10907)
   If your computer and printer are turned on, you can wirelessly print using your phone. You’ll need to configure Cloud Print in Google Chrome on your PC. Then download the Cloud Print app to your phone. For full instructions on how to configure Cloud Print, go to page 66.

9. **Boost your battery life**
   **JuiceDefender**
   [www.snipca.com/10903](http://www.snipca.com/10903)
   This useful app can add hours to your phone’s battery life by shutting functions down and minimising what your phone does when you’re not using it. Download the app and tap ‘enable’ to turn it on. By default it selects ‘balanced’ mode, which will be more than adequate for most people. JuiceDefender takes a whole day to work out how you use your phone and will then change settings accordingly.

10. **Access apps more quickly**
    **SwipePad**
    [www.snipca.com/10894](http://www.snipca.com/10894)
    Scrolling through a huge list of apps isn’t the best way to find them. SwipePad adds a quick-access panel so you can instantly get to your most used apps. Install the app, go through the tutorial and then tap Pads and ‘Default pad’. You can add up
to 12 apps you use often and even create a link that makes calling or texting a specific person that much easier. Back on the Android home screen tap and hold the left edge of the screen and swipe your finger inwards to open SwipePad. Without lifting your finger move over the app you want and release to open it.

11. Take control of your privacy
AVG PrivacyFix
www.snipca.com/10904
AVG’s PrivacyFix helps you wrestle back control of your privacy from online advertisers and social networks. Once installed connect the app to your Facebook and Google accounts by tapping the Connect buttons for each. AVG will tell you which privacy settings you should change to keep your information private. At the bottom of the app’s homepage you can opt out of all targeted adverts in your mobile browser.

12. Automate virtually any task
IFTTT
www.snipca.com/11987
IFTTT has now released its Android app. It’s the best app for connecting two online services or apps. For example, you can create a ‘recipe’ that automatically saves any photos you take on your device to your Google Drive or Dropbox account. IFTTT does a whole lot more besides. Head to https://ifttt.com for an idea of what this amazing tool can do.

13. Make free phone calls
Viber
www.snipca.com/11989
The best app for making free calls to anyone in the world recently got a complete makeover. It now lets you send multiple photos and videos at the same time, send longer video messages and block numbers you don’t want to contact.

14. Read about the latest innovations
Science Today
www.snipca.com/11991
Science Today is an app from the California Academy of Sciences which contains news, features and video interviews about our planet, space, sustainability and technology. It features articles by prominent academics and high-definition videos covering the topics of your choice in minute detail.

15. View and share online photo albums
Carousel
www.snipca.com/11879
Dropbox’s new app Carousel, imports your saved Dropbox images and categorises them into albums by date and location. Tap a photo to see it, swipe up to add it to a group of images you want to share or down to hide it from your collection. Recipients can then download any image in its original resolution.

16. Get soundtracks for your ebooks
Booktrack
www.snipca.com/11881
Booktrack brings your ebooks to life by adding movie-like soundtracks to them. You can read thousands of classic and contemporary ebooks, poems and short stories for free. You can also preview paid-for titles before you buy them.

17. Listen to the latest headlines
Newsbeat
www.snipca.com/11788
If you like to listen to world news when you’re driving or taking a walk, then download Newsbeat, which narrates news stories to you. It lets you customise the news based on your areas of interest, publications and news organisations. In time, Newsbeat will tailor its stories to suit your needs.

18. Join a chatroom
Banter Chat
www.snipca.com/11685
Banter Chat contains chatrooms you can join if you want to talk to people about topics that interest you, such as News, Travel and Computers. You can create your own public and private chatrooms to chat with like-minded people and use a pseudonym if you want to remain anonymous.

19. Speed up your phone
The Cleaner
www.snipca.com/11686
If you want an app that will instantly make your phone faster and prolong its battery life by killing background tasks and deleting your phone’s cache, download The Cleaner. It lets you schedule these tasks, so you don’t need to carry them out manually.
20. Get a business card scanner
FullContact Card Reader
www.snipca.com/11604
FullContact lets you add contact details to your device by taking a photo of a business card. A FullContact employee then sees the photo and adds the details to your app. You can then export this to your address book.

21. Send free text messages
BBM
www.snipca.com/11484
The update to BBM (BlackBerry Messenger) includes new features such as the ability to make free calls to iOS and Android BBM users. Another new feature lets you share a temporary map of your location until the timer runs out.

22. Keep an inventory of your possessions
Encircle: Home Inventory
www.snipca.com/11485
This app lets you create an inventory list of all the items in every room of your house. It lets you add images of items by room as well as detailed information about the items you're adding. If the worst happens, this is a great way to reclaim your items through your insurance.

23. Organise your photo collection
Tidy
www.snipca.com/11518
Tidy is a very handy tool that helps you organise your photos by grouping them into albums by time (day, hour, month, year), by distance (km, 100km, 1,000km) and even by shape (panoramas, screenshot, landscape and portrait). You can swipe to move photos to an album, archive them and copy them from one album to another.

24. Wirelessly access files on your PC
ES File Explorer File Manager
www.snipca.com/10877
Getting at things stored on your PC from your Android tablet is often easier said than done. ES File Explorer File Manager lets you do this and includes video and audio players so you can stream files from your PC to your tablet. To find your computer, just make sure that you’re connected to the same Wi-Fi network. Then open the app and tap LAN. You’ll find even more detailed information about how to use ES File Explorer on page 76 of this guide.

25. Listen to any radio station
TuneIn Radio
www.snipca.com/10878
Radio is about more than FM and DAB these days. TuneIn Radio hooks up your Android tablet up to a wide range of stations, letting you listen to music, sport and chat wherever you are. To use it, open TuneIn, tap Browse and you’ll see the available stations. Selecting Local Radio is a good place to start for more familiar stations, or search by genre or location and listen to thousands of stations from around the world.

26. Learn a new language
Babbel
www.snipca.com/11405
Have you ever wished you could speak another language? If so, you may have heard of Babbel, a popular language-learning website. While it has previously had apps that help you learn individual languages, this is the first Android app to let you learn all 12 languages within one app. You can learn Spanish, French, German, Italian and more.

27. Get personalised videos
5by
www.snipca.com/11406
This app suggests videos you’ll like based on how much spare time you have and your mood. When you first launch the app, it works out your interests by asking you questions. Choose from useful channels such as ‘True Story’ and ‘History Buff’.
Get the best Windows tools on Android

Turn your phone or tablet into a pocket-sized PC by adding your favourite Windows features to the mobile OS. We explain how.

Get a Windows 8-style home screen
Aside from the latest HTC handsets, such as the HTC One (bit.ly/htcone327), many of the Android devices on the market can look a bit samey, whereas the colourful Windows-powered Nokia Lumias are among the most attractive phones you can buy.

If you want to stick with Android, but give your smartphone or tablet a bit of a Microsoft makeover, install the amazing app Launcher 8 Free (bit.ly/launcher327). This lets you customise your home screen with colourful, Windows 8-style tiles, which give you one-tap access to your messages, contact, settings and other essential tools.

You can add more widgets and frequently used apps to the screen, and long-press a tile to change its size and colour, and move or remove it. Launcher 8 Free looks fantastic and lets you easily switch back to standard Android home screen when you want. For more on customising Android, turn to page 118.

Clean and speed up your device
Although Piriform announced CCleaner for Android early last year (bit.ly/ccleaner343), at the time of going to press it’s still in beta. Until the final app is released (which should hopefully be soon), there are other options you can try. One of the most popular and highly rated (4.7 out of 5 on Google Play) is KS Mobile’s Clean Master (bit.ly/clean327), which reclams space and memory on your phone or tablet, as well as protecting your privacy. It does so by deleting junk files, closing background apps and clearing personal data such as your browsing and search history. As with CCleaner, you can review what you’re going to remove before performing the clean-up, and see how much space and memory you’ll regain.

Alternatively, you could try AVG Cleaner (bit.ly/avgcleaner337), which works in a similar way but with the bonus of an Auto Clean feature. This lets you schedule clean-ups to run daily or weekly, depending on how much you use your device and the amount of space available.

Play audio and video files on the move
There’s certainly no shortage of media players for Android devices, but our long-time favourite VLC is still in beta (bit.ly/vlc337) and Windows Media Player Mobile is only available on Windows Phone.

If you need a free app that can play both music and video, is easy to use and doesn’t keep crashing, there are several good options available. MX Player (bit.ly/mxplayer337) is one of the simplest and fastest, automatically detecting video files on your device so you can watch them instantly. You can display subtitles from an external file, if they’re not embedded in the movie. To play music in the app, too, go into MX Player’s Settings, tap Audio and select ‘Use as an audio player’.

We also like Ultimate Media Player (bit.ly/ultimate337), which supports a huge number of audio and video formats, helpfully organises tracks by artist and lets you fiddle around with playback speed and sound quality (using the equalizer).
Get the best Android tools in Windows

You can also add tools from your phone or tablet to your PC. Here are four ways to go mobile on your Desktop.

Create folders using drag and drop
One of the most useful features built into Android is the ability to create a folder simply by long pressing an app and dragging it on top of another one. You can add this functionality to Windows to save you having to right-click and select New Folder (or click the New Folder button in Windows Explorer) using a free tool called Smart Folders (bit.ly/smart337). Once installed, this lets you drag and drop one file or more onto another to instantly create a folder and move all the items into it. Give the folder a name and click OK.

Get the Android interface in Windows
Although BlueStacks App Player lets you run Android apps on your PC, it doesn’t replicate the design of the mobile operating system. Your best bet is Windroy (www.socketeq.com). This looks and works exactly like the Ice Cream Sandwich version of Android, from the Home and Back buttons, and slide-to-unlock option, to the Settings panel, widgets and wallpapers. There’s even an Android-style on-screen keyboard and a camera app.

You need to register the program, but this is free to do.

Play Android games on your PC
If you want to play favourite Android games, such as Candy Crush Saga, Temple Run and The Simpsons: Tapped Out on a larger screen, install the fantastic Android emulator BlueStacks App Player (www.bluestacks.com/app-player.html). This free program lets you run mobile games and other apps on your Windows (or Mac OS X) computer. Once installed, browse Google Play for games and open them on your Desktop (you’ll need to sign into your Google account). There’s also an option to sync apps with your phone.

Check your calls and texts
If you’ve left your Android phone charging in another room, you can use the Chrome extension Spots (bit.ly/spots337) to ensure you don’t miss any calls or messages. It lets you read and reply to texts via your browser and get call or SMS notifications on your Desktop without needing to touch your device. You’ll need to install the Spots - Magical Launcher app (bit.ly/spot-sapps337) on your handset to connect it to your PC, but this is free and, once set up the service, couldn’t be simpler to use.

View and edit Microsoft Office files
Purchase an Office 365 Home Premium subscription (€79.99 per year from office.microsoft.com) and you can open, edit and share Office files on up to five devices, including an Android phone. However, Office Mobile for Office 365 (bit.ly/office365) doesn’t currently work on Android tablets. For a free alternative, try Kingsoft Office + PDF (bit.ly/kingsoft337), which works on any device running Android 2.1 or later. This full-featured suite lets you create, view and edit files in Microsoft Office formats, including DOC, DOCX, XLS and PPT, and integrates with your email app to make sending and opening attachments a breeze. You can also upload and download files to and from Dropbox and Google Drive, save documents as PDFs, insert pictures and charts, and even connect a Bluetooth or USB keyboard to make typing easier.

Also worth a look is QuickOffice (bit.ly/quickoffice337). It works seamlessly with Google Drive and provides 15GB of free online storage.

Browse and manage files and folders
One of the biggest differences between Windows and Android (and iOS) is the lack of a Windows Explorer-type tool for easily navigating and organising files and folders on your device. Fortunately, there are some excellent free apps that bring this functionality to your phone or tablet. We particularly like ES File Explorer File Manager (bit.ly/esfile337), which was one of the essential free phone apps that we recommended in our guide on page 52.

You’ll find further information about using ES File Explorer File Manager on page 76 of this guide. And we promise you that once you’ve installed ES File Explorer on your device, you’ll wonder how you ever managed without it.
Alternative web browsers

Android’s stock browser is good, and Chrome is better, but they face stiff competition. We reveal six free Android browsers that outclass Google’s

**MAXTHON**

bit.ly/maxthon339

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**WHAT DID WE LIKE?**

Android browsers tend to be either fast or feature-rich. Maxthon, like Chrome, manages both - but you get much more control over how the browser looks and behaves.

As well as loading pages quickly and smoothly, Maxthon also launches faster than most other apps on our phone (we used an HTC One X running Android 4.2.2). Connection and hardware permitting, this is the one Android browser that feels as powerful as the browser on your PC.

Maxthon’s performance doesn’t come at the cost of features. Beyond the bright, neat tabbed home screen you’ll find built-in file and task managers, editable screens, support for Flash, RSS and PDF, a decent selection of add-ons, and superb customisable gesture controls that make Maxthon feel more personal than Chrome and Dolphin.

Maxthon comes in all flavours, including Windows for PC, Windows Phone and iOS as well as Android, and it syncs your bookmarks and other data smoothly and securely between them. Sync settings, incognito mode and other options are a tap away from any screen in a neat control panel. Data is compressed to optimise performance, which is good news for your data allowance and battery.

**HOW CAN IT BE IMPROVED?**

The choice of add-ons falls short of longer-established browsers like Chrome or Dolphin, and there’s no Dolphin-style tool for encrypting back-ups. Similarly, sharing options are limited.

**OUR VERDICT**

Fast, smooth, beautifully-designed browser that you can customise to your liking and sync across all your devices. Given more add-ons and sharing support, this could be the only browser you’ll ever need.
**DOLPHIN BROWSER**
dolphin.com

**What did we like?**
Dolphin shows Maxthon and Puffin how add-ons should be done. It’s essentially the only app you need, because you can email via Gmail without installing the Gmail app, generate and manage your passwords securely via LastPass without installing the LastPass app, and so on (dolphin.com/add-ons).

Many Android browsers, including Chrome and Puffin, have ditched tabs to save screen space, but Dolphin realises that we like seeing all our open pages without having to tap icons or scroll through thumbnails. There’s no feeling of clutter, thanks to the ‘slidebars’ that reveal bookmarks, add-ons and other menus with a quick swipe in from right or left.

Gesture and voice controls are excellent, and you can install Dolphin on different platforms and keep your content in sync.

**HOW CAN IT BE IMPROVED?**
There’s no incognito mode in Dolphin. Maxthon’s one-tap Private Mode is simple, vital feature that we’d like to see on all mobile browsers. Dolphin is also much slower than Maxthon, with laggy Flash.

**OUR VERDICT**
Slick, innovative and packed with content, Dolphin has it all – but sometimes you wish it had a bit less. If you’re on an older device and your mobile data is limited, you’re better off with a smaller, faster browser like Puffin.

**RECOMMENDED**

**BEST OF THE REST**

**UC Browser**
bit.ly/ucbrowser339
UC’s home screen is a mess of tacky links to things called 9Game and HotVideo, with occasional ‘rate us!’ pop-ups to compound your irritation. Beyond this hideous exterior lies one of the best Android browsers around, rich with tools such as cloud sync and a powerful download manager. It’s also extremely fast and reliable, thanks to smart technology that adapts to your network speed. It’s just a shame that UC has decided to keep people away with its infuriating launch screen.

**Opera Mini**
bit.ly/opera339
The app that calls itself “the world’s fastest Android browser” certainly is quick, but no faster than Maxthon or Puffin. We love the tabbed layout, the big, clear buttons and the Speed Dial feature that gives you on-tap access to your favourite websites. However there’s an emphasis on social networking which we found a bit overbearing. If you’re a Facebook fan or Twitter addict, this is the browser for you, and if you’re not, it probably isn’t. It’s also optimised for Samsung or Sony phones, though it worked fine on our HTC.

**Firefox**
bit.ly/firefox339
Firefox, like Android, is an open platform that’s very developer-friendly. As a result, it offers an unbeatable choice of add-ons and sharing options. Security settings are also superb, and it handles streaming video without a hitch. But we found it surprisingly dull. The tiled home screen is sparse and uninspiring, and you’re left to fill it with links. By contrast, Maxthon’s home screen is full of pre-filled tiles that make you want to dig in immediately. For a peek into Firefox’s future, try the Firefox beta app (bit.ly/foxbeta339).

**PUFFIN**
www.puffinbrowser.com

**What did we like?**
Puffin is simple, light and fast, making it ideal if you’re on an older Android or a slow connection. But Puffin’s masterstroke is its virtual trackpad, which gives you a cursor for clicking links and selecting text. It’s brilliantly useful if your fingers aren’t as nimble (or tiny) as they used to be.

Innovative trackpad aside, Puffin concentrates on getting the basics right. Predictive searching is very good, and pages load instantly in a new tab. Bookmarking is quick and efficient – just swipe a tab to add it – and the bookmarks manager is one of the best we’ve seen. Efficient searching, page loading and bookmarking, plus a default pop-up blocker and Do Not Track option – what more do you need?

**HOW CAN IT BE IMPROVED?**
Most pages load amazingly quickly, but if there’s Flash or animation involved, forget it. Flash, which is only available during the day in the free version, is not worth the bother and we’d recommend switching it off in settings. Scrolling can be choppy, and we couldn’t make it work in the trackpad.

**OUR VERDICT**
Puffin is a very well-intentioned browser. Its lightweight design keeps your data usage low and is great for battery life. Its virtual trackpad is a thoughtful addition. But it has very few add-ons, its help page is paltry and it feels amateurish compared with Chrome, Dolphin or Maxthon.
Great games for Android

Apps aren’t just there for stock prices and weather reports. The Google Play store is stuffed with games too – here’s our pick of the best ones.

There’s no longer any need to buy a dedicated portable gaming device. Your tablet or phone can do everything a Nintendo 3DS or Sony PlayStation Vita can and more besides. The advanced hardware packed into today’s Android devices means effects and 3D graphics look incredible. Nor is that the only advantage of owning a powerful Android tablet. As with standard apps, games are much cheaper than they are on a console, portable or otherwise, with prices starting at zero pence and rarely topping the £5 mark.

As well as great graphics, the best games use the touchscreen to control the play, while some rely on advanced features, such as the accelerometer built into your device for motion controls, although this kind of play can sometimes be a bit hit and miss.

Android smartphone owners will find some of the games they’ve bought also run on tablets and vice versa, in which case they’ll be waiting for download in the Google Play Store. And there are thousands more great games just waiting to be discovered and downloaded to your home screen.

The age and price of your device will go a long way towards determining the kind of games you can play. If you buy a brand-new tablet like the Google Nexus 7, you can pretty much take your pick of any demanding 3D game in the store. But if you’re trundling along on an older device, or opt to save money with a budget model, you may find that its graphics chip is too weak to handle the latest games smoothly. They may still run, but in scenes with lots of action gameplay may slow down, sometimes to unplayable levels. There’s not a lot you can do about this, as the core specifications of a tablet aren’t upgradeable.

The one thing you can do to avoid this happening at all is to choose the right device. Be sure to read all of our reviews in Chapter 2, where we talk about performance. If we mention 3D gaming issues and gaming is a priority for you, it’s best to look elsewhere.

Google curates the best and most popular titles in the Games section of the Play Store. Even still, it can be hard to find which are the best ones to play. That’s why we’ve rounded up our favourites, many of which are completely free to download.

Real Racing 3
Price: Free

Those who think of Android tablets as mainly for light puzzle games will surely be astonished by the console-quality graphics in this action-packed racing game from EA. Drive some of your favourite real-life cars on immaculately recreated tracks, and jostle with rivals to pick up victories that let you improve your car before the next race. It’s exciting stuff, but be warned: it takes up over a gigabyte of your storage, so might be best avoided on some tablets.

Football Chairman
Price: £2.99

For those who still haven’t given up on their dream of taking a football team to the very top, Football Chairman lets you experience the thrill of working your way up through seven divisions, hiring and firing managers and players along the way.
Top Gear: Race the Stig
Price: Free
This simple racing game pits you against the elusive Top Gear mascot The Stig as you race through famous locations from the BBC TV show. Choose your car from the Top Gear archive, which includes Jeremy Clarkson’s Italian police car with Ben Hur wheels and James May’s amphibious Triumph Herald, customise your outfit and share your scores online.

Angry Birds Star Wars II
Price: 79p
The adventure continues for the Skywalkered birds and pigs, with no fewer than 120 new levels to fling them through. There’s also a range of Telepods toys that interact with the game, which could make the ideal present for a 10-year-old.

Fiz: Brewery Management
Price: £1.28
In this game, you’re challenged to grow your own brewery from humble beginnings into a world-renowned symbol of booze excellence. The app includes more than 60 beer recipes, making it a must for home-brew fans.

Candy Crush Saga
Price: Free
In the ridiculously addictive Candy Crush, your job is to destroy a grid of sweets by matching up their colours. It sounds like pretty straightforward puzzle-gaming stuff, but there are over 400 levels to get through, with a wide array of power-ups that keep the game feeling fresh as you get further and further along. It’s a free game but, as is becoming more and more common, it starts putting stupidly hard levels in the way later on, which, of course, you can pay to make easier.

Sonic Dash
Price: Free
The world’s fastest hedgehog is back, and this time he’s 3D. Your challenge is to make Sonic run as far as he can whilst dodging hazards, leaping barriers, defeating familiar enemies and, of course, collecting rings. The app is free but includes in-app purchases, so this may be one to keep away from light-fingered, spendaholic youngsters.

The Room
Price: 69p
If you haven’t been in The Room yet, you’re in for a treat. Few puzzle games can match its glorious sense of mystery,
Doctor Who: Say What You See
Price: £1.99

The 50th anniversary of Doctor Who last year spawned a wealth of fun and inventive content. This latest tie-in game features a series of cryptic picture puzzles that conceal the Doctor’s companions, gadgets and monsters.

Plague Inc
Price: Free

At first glance, Plague Inc looks complicated, and in some ways it is, but don’t let that put you off. This marvellous game is about disease; not curing it, but spreading it. You choose a virus and a starting country, then set about evolving your symptoms and transmission methods to try and spread to nearby countries, then develop resistances to counter the cure research that soon starts as you begin to wipe out the human race. That’s your overall goal and achieving it isn’t easy.

Asphalt 8
Price: 69p

Where Real Racing 3 goes for realism, Asphalt has always been about pure, over-the-top arcade fun. Perform dramatic aerial stunts off ramps as you tear around a variety of inventively tracks in real-life high-performance cars, such as the Bugatti Veyron and Pagani Zonda R. A career mode and the ability to race against the ghosts of your previous best laps will keep you coming back for more, and the track keep adding new game modes to keep things interesting.

Sky Sports Pub Challenge
Price: Free

Next time you’re watching a Premier League game in the pub, put your phone to more lucrative uses than just shouting about the score to your friends. This app is a statistician, predictor game, pub locator, fixtures list, events organiser and pub quiz – complete with a £20,000 end-of-season jackpot – and it’s completely free. Do try to watch some football while you’re at it.

Plants vs Zombies
Price: 69p

It really shouldn’t work, but somehow it does. This tower defence game sees a steady flow of zombies entering your garden. And you have to stop them with Plants, obviously. Different plants have different attacks and effects, and the key is to line them up cleverly so range-attack plants sit behind more melee-style plants. With a lovely variety to the zombie hordes, and a cartoonyish style that masks the deceptively demanding gameplay, it’s a must-have.

River Cottage Get Foraging
Price: Free

Look before you cook with this half-game, half-recipes app from Channel 4. Choose one of 20 recipes from Hugh Fearnley-Whittingstall’s River Cottage books, and Hugh will send you foraging in his garden for seasonal ingredients and hunting around his kitchen for the right utensils. You’ll learn a lot, and it’s a great way to bring cookery alive.

Countdown
Price: 69p

Channel 4’s iconic word game finally has an official app. Just as on the TV show, you’re challenged to find the longest words possible and solve maths problems. It includes full Oxford English Dictionary and lets you play alone or against a friend.
**Temple Run 2**  
**Price:** Free

The endless runner genre is now hugely popular, but Temple Run really started the craze. It’s a very simple game; your character runs forward automatically at all times, and you have to tilt your device to shift him left and right on his narrow runway to avoid obstacles and collect gems, and swipe left and right on the screen to turn corners as they arrive. The goal is just to keep running as long as possible, which gets extremely challenging after a few minutes. Upgrades between runs help.

**Fruit Ninja**  
**Price:** Free

One of those games that, like Angry Birds and Temple Run, seems to be a default choice on every tablet, Fruit Ninja is nevertheless a great way to while away a short tube journey. It’s not exactly complicated; fruit flies up in the air, and you have to slice it in half with your sword. As you progress, the basic gameplay is complicated by bombs and other best-avoided items that mingle with the fruit to confuse and confound you. There’s a fun two-player mode, too.

**NOVA 3**  
**Price:** £4.99

If you want to go down the big blockbuster shooter route, they don’t come much louder than NOVA 3, which stands for Near Orbit Vanguard Alliance.

**Terraria**  
**Price:** Free

Exploration is key in Terraria, a retro platform game that sucks you in as you delve deeper and deeper into its amazing world. Your little avatar must dig for materials to craft increasingly complex items, which help him progress further and further from his starting point in the forest. Yes, it has an element of Minecraft about it, but it’s delightfully put together, and it’s a game that really rewards the patient gamer. Be warned – it’s not the easiest game to get into.

**Super Hexagon**  
**Price:** £1.99

And now for something completely different. Super Hexagon is about as simple as a game can be to look at, and each game lasts barely a few seconds unless you’re really good at it, but it’s that quick-play design that makes it so incredibly compelling. You’re a tiny triangle and, as the hypnotic shapes close in, to a pulsating electronic soundtrack, you simply slide left and right to manoeuvre through the gaps. It sounds simple but it’s practically impossible, even on easy mode.

**Angry Birds**  
**Price:** Free

We mentioned its Star Wars spin-off earlier but no gaming guide would be complete without mentioning the original Angry Birds. Here, the goal is simple: using a catapult, launch your various birds across the screen to kill little green pigs. Still fiendishly addictive, Angry Birds is the first genuine touchscreen classic.

and basic swipe-to-shoot mechanics make it easy to pick up and play, and become addicted.
Essential tasks

From sharing files with your computer to printing your photos, we show you how to perform those essential everyday tasks.

It’s all very well taking photos on your Android phone or using an office app to knock up a proposal on your tablet. But what happens when you actually want to share or print these files? Luckily, there are quick and easy solutions to these and other day-to-day tasks, such as connecting to other devices, setting up alerts and managing your storage. They might not sound like the most glamorous functions, but knowing how to carry them out can help you get even more from your Android tablet or phone. In this chapter we explain how straightforward it can be to get the job done.

HIGHLIGHTS

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Transfer files between your Android device and a PC

We explain the best ways to connect your phone or tablet to share files and make backups.

Being able to share files between different devices is crucial. Not only does it mean you always have access to your most important files and folders, but it also ensures you’ll never lose an important photo or document. Android tablets and phones are versatile devices and can connect to PCs quickly and easily. A simple USB cable gives access to files stored on the Android device and allows files to be added without the need for additional software. Synchronising files and folders via the cloud is another great way to access data across different devices. With a few simple tools, the files on your Android device can be easily shared with a PC. In this guide we’ll show how to get connected.

The most obvious way to connect a tablet or smartphone and a PC is to use a USB cable. Most Android devices have a micro USB connection and come with a cable to connect it to a USB port on a PC. As well as for moving across files, the USB connection can usually be used to charge your device from the computer without needing to plug it into the mains. This isn’t always the case, however, so it is worth checking the instruction manual first. Once connected to a PC, the tablet or phone should be recognised like any other USB storage device or media player. An AutoPlay dialogue box, much like the one pictured on the left should appear, with options to sync or view files or import pictures and videos stored on the device.

**STEP 1**

Click ‘Open device to view files’ in the AutoPlay box – or, if the AutoPlay box doesn’t appear, just press Windows + E to open an Explorer window and double-click the icon for your phone or tablet. The folders on the device will probably seem quite confusingly arranged, with some of them quite irrelevant. The important ones are DCIM, which will contain pictures, while folders for Movies, Music, Podcasts and Ringtones should be fairly self-explanatory. In these instances use Windows Explorer just as you would for any other similar device, dragging and dropping to copy files back and forth between devices.
A better and more seamless way to manage files between a PC and an Android device is to use cloud storage. Web-based storage allows you to synchronise files stored on a number of different devices. One of the best cloud applications for Android is Dropbox (www.dropbox.com). If you already use Dropbox, adding it to your Android phone or tablet is simple. Open Google Play and search for Dropbox. Select install and then open. Read through the brief explanation of features to get to the login and registration screen. If you already have a Dropbox account, sign in with your details to view all the files and folders synchronised on it.

Files in Dropbox can be viewed or edited as long as you have an app that can open them – for example QuickOffice (www.snipca.com/12161) for documents. Changes made to Dropbox files on the tablet or phone will be synced so when they are accessed from another device the changes will have been made. Dropbox for Android can automatically upload photos and videos taken using the device. To set this up, tap the menu (three dots) icon, then tap ‘Turn on Camera Upload’. Underneath you can choose whether to upload via Wi-Fi only if you don’t want to affect your mobile data allowance. You can also choose to upload photos only if you don’t want to upload video too.

WiFi File Transfer is a free app that lets you connect your PC and Android device over your home network wirelessly to manage and transfer files without the need for a USB cable. Install the app on your device from Google Play (www.snipca.com/12160), and make sure your phone or tablet is currently connected to your Wi-Fi network. Then, simply open it and tap the button in the middle of the screen to switch it on. Underneath you’ll see a network address that starts with ‘ftp://’. On your PC, press Windows + E to open an Explorer window, then type the network address into the address bar and press Enter. You’ll access all your Android device’s folders and transfer files to or from your PC, just as if you had connected via USB.

Another option is to connect an Android device to a PC using Bluetooth. A lot of computers, especially laptops, support Bluetooth connectivity and this can be a handy way to quickly move across a file if you are nowhere near a wireless network. Make sure your PC’s Bluetooth is switched on too, then on your tablet or phone, tap Settings. Under Wireless & Networks, tap the slider next to Bluetooth to switch it on if it isn’t already activated. Next, tap the word ‘Bluetooth’ itself. If your PC isn’t listed under Available Devices, tap Search For Devices. Tap your PC’s name when it appears to pair the two devices. Back on your PC, search for a device using the Bluetooth tool your computer. Once the Bluetooth pairing process is complete, it will be possible to move files between the two devices. It’s a far slower and more convoluted process than using a wireless network, but useful as a last resort.
Print any file from your device

You don’t need a special printer to print from your device – here’s how to print anything from anywhere.

Google Cloud Print lets you print directly from an Android device to special ‘Cloud Ready’ printers. However, even if your existing model isn’t compatible with this standard, you can still print to any standard printer through Chrome. You just need to make sure the latest version of Chrome is installed on the PC the printer is attached to and, after a couple of quick setup steps you’ll be ready to print over the air from anywhere. You’ll also need to set up Cloud Print on your Android device. Most newer devices come with Cloud Print support built in and you can print from directly within many apps. But even if your device doesn’t include native Cloud Print support there’s a way to add it and print almost any file. We’ll show you how. This workshop shouldn’t take any longer than 10 minutes to complete.

**STEP 1**
On your PC, open Chrome and sign in with your Google account, if you aren’t already. Click the menu button (the icon with three stacked bars in the top right of Chrome’s toolbar) and choose Settings. Scroll to the bottom and click on ‘Show advanced settings’. Scroll down to Google Cloud Print and click the ‘Manage’ button. On the screen that opens, you should see a list of any Android devices you own towards the bottom, along with an option to ‘Save to Google Drive’ as a PDF. Ignore these and click the ‘Add printers’ button just above.

**STEP 2**
Sign into your Google account on the web page that opens if prompted and view the list of printers here. The list may include things like ‘Microsoft XPS Document Writer’, which you don’t need, and all the available options will be checked by default. So uncheck any unnecessary options and leave only your ‘real’ printer ticked. You can also leave a tick in the option at the bottom to ‘Automatically register new printers I connect’ if you wish. Then click the ‘Add printer(s)’ button. Your printer should be added automatically. Click the ‘Manage your printers’ button to see a list of all the printers you can print to and check your local printer is there.
STEP 3
Depending on the device you’re using and the apps you want to print from, you may find you can already print via Cloud Print. Android 4.4 Kitkat, for example, has built-in Cloud Print support. To check that your printer is available, tap Settings, then scroll down and tap Printer. Cloud Print should be listed here as ‘On’. Tap it and your device will retrieve a list of available printers. If you’ve followed the steps this far, the list will include the ‘Save to Google Drive’ option, along with an entry for the printer you set up in Step 2.

STEP 4
Some Google apps, like Google Drive and Gmail, let you print directly from the menu. Tap the three stacked dots and look for a Print option. Tap this and a dialogue box like the one shown should appear. If your printer isn’t already selected, tap and select your printer from the list. You can choose other settings here too – colour or black and white, paper size, orientation and page range. Make your selections, then tap Print. If your printer or PC is switched off at the time, then Cloud Print will save your job in the print queue in the cloud and send it to your printer as soon as it comes back online.

STEP 5
If your Android device doesn’t have Cloud Print support built in, you can install an app from Google Play – head to bit.ly/print316 to get it. Make sure your printer is set up on your PC as per Steps 1 and 2, then launch the Cloud Print app and make sure you choose the same Google account you signed in with when you set up Cloud Print. Once you’ve authorised this, tap done and you’ll see a list of printers – tap your printer name to set it as the default, then tap Yes to print a test page.

STEP 6
The other major benefit of the Cloud Print app is that it allows you to print almost any type of file from your device, regardless of whether the app you’re using to view or edit the file has a ‘Print’ option in the menu. To do so, open the Cloud Print app, tap the Local tab at the top. Tap Files, browse for the file you want to print, then tap it and tap Yes to confirm. Alternatively, you can print from many websites and online services by tapping the Web tab and selecting your source.
Control your PC via your Android device

Have you ever wanted to check something that's on your PC when you've been sitting in another room? Perhaps you wanted to dig out an old photo or email someone a document, without getting out of your comfy chair and going over to the PC. Alternatively, if you've got a film playing on your PC, or someone else is using it, you might want to access something from the hard drive without disturbing what's currently happening on-screen.

If you have a tablet or smartphone to hand, and are armed with the right software and apps, you can remotely control your PC, view important details about it, and access vital features without having to go anywhere near it. You can also use your tablet as a second display, so you can check your email, look something up, chat to a friend, and do many of the things you can do on your PC, all from your tablet.

Roccat Power-Grid
Roccat's free program Power-Grid (bit.ly/roccat343) lets you connect to, monitor and control your PC directly from any Android device. It's designed for gamers, who can use it to keep in touch with friends via Skype (www.skype.com), Facebook (www.facebook.com) or TeamSpeak (www.teamspeak.com) while playing, but there are plenty of regular tools available, making it useful for anyone. It's also hugely customisable.

Install the program on your PC, add the app to your Android phone or tablet, then link them. See our Mini Workshop on page 69 for help setting this all up, and check page 70 for help configuring it. You can then monitor and control your system using 'grids'. These are customisable panels that let you do various things, such as monitor system stats, communicate with friends, control your computer's audio and tweak Windows settings. The default grids will be fine for most users' needs, but you can add additional ones, customise the settings, and even create your own. You can also download grids through the web store.

Because the program is built with gamers in mind, many of the downloadable grids are for particular games, including as Minecraft (minecraft.net), Grand Theft Auto (www.rockstargames.com/V), and Skyrim (www.elderscrolls.com/skyrim). However, there are also sections for Windows and Office. Available Windows grids include a web browser, a QWERTY keyboard and a media player controller. There are also grids for popular programs and services, including MediaMonkey (www.mediamonkey.com), Facebook, Adobe Photoshop (www.adobe.com/).
UK), VLC Media Player (www.videolan.org/vlc), Microsoft Word (office.microsoft.com) and Spotify (www.spotify.com). All the grids are currently free, but it’s possible some paid premium ones will be added to the store in the future.

Power-Grid is easy to set up and use, although customising it and making your own grids from scratch is a little trickier. The website does offer some video guides to get you started and it doesn’t take long to master. If you produce a grid that you think others might appreciate, the website makes it easy to export and share your creation through the web store.

Other PC monitors

PC Monitor (www.mobilepcmonitor.com) lets you keep an eye on your computer through your Android phone or tablet. Despite the ‘PC’ in the name, the agent install isn’t limited to Windows, it can also be used on Linux, Mac OS X and even Raspberry Pi. Unlike Roccat Power-Grid, PC Monitor is aimed at professional system administrators because of the sheer level of detail it provides on the computers you’re monitoring, but you can manage up to five computers for free. You can use it to view hardware status, memory and CPU usage, running processes, services, and scheduled tasks, and remotely lock, log off, shutdown, restart, and hibernate your PC.

AVG Zen (bit.ly/zen343) lets you connect all your family’s PCs and Android devices, and check on their security from anywhere. If someone disables a component, or your antivirus shields malfunction, you’ll be able to see at a glance what’s wrong, wherever you are.

If you use a mixture of Android and iOS devices, then you might be interested to learn that iStat 2 (bit.ly/istat343) lets you remotely monitor a PC or Mac using an iPhone or iPad. It provides detailed system information on CPU, memory, drive space, network usage, temperatures, fan speeds and more.

There are also history graphs, so you can see how something performed over time. It costs £2.99 for the iOS app.

MINI WORKSHOP  Set up ROCCAT Power Grid

Step 1
Go to bit.ly/pgdload343 and install the software on your PC. Open Google Play and download the mobile app for your Android device. Launch the Windows program and create an account. Log into the software, then open up the mobile app and click the Scan button. It should find the host and allow you to select it.

Step 2
You can manually enter the host/IP if it doesn’t appear, or if you’re not connected to the same network. A pop-up on your PC asks you to confirm the pairing request. Say Yes. A Pairing Successful message appears on your mobile device and the app will be ready to start using. Click the Start button and the System Stats screen opens.

Step 3
You can view info about your PC’s CPU and memory, your internet usage statistics and the amount of free space on your drives. There are also stopwatch and timer functions. Incoming Center lets you keep on top of emails, Facebook, RSS feeds and more. Sound Control lets you control the PC’s audio.
Remote access your PC

You can view and control your computer on an Android tablet using programs and apps like Splashtop (www.splashtop.com) and TeamViewer (www.teamviewer.com). Splashtop is very flexible and works with both Windows and Mac. Install the free Splashtop Streamer on your computer, then install the Splashtop 2 Remote Desktop on your Android device (free with in-app subscriptions). There are other Splashtop apps available to download from the Google Play store, including Splashtop Extended Wireless Display (lets you use your tablet as a second screen) and Splashtop Whiteboard.

TeamViewer is primarily aimed at business users and IT support professionals, but can be used to access your PC (or that of a friend or family member) so you can control it using your Android device. The program is entirely free for personal or non-commercial use.

Another option is Microsoft’s own Remote Desktop app (www.snipca.com/12162). This is a free tool that gives you full control of your PC via Windows’ built-in Remote Desktop feature. The only catch is it doesn’t work with Home versions of Windows – you’ll need Windows 7 or 8 Pro to get it to work. For a full list of supported versions, visit www.snipca.com/12163.

▲ Splashtop provides full control over your Windows PC from your Android device

**MINI WORKSHOP**

**Configure and use Roccat Power-Grid**

**Step 1**
From the PC Launcher you can see what grids are available in the mobile app and configure them. The Preset Grids are what’s currently accessible. Select one and the bar on the right will display the in-app view. There’s a choice of Custom Grids available.

**Step 2**
The two Windows 7 Controls are good grids to consider. Once added to the bar, you can select them at the bottom. Next, click Apply to add the grid to the mobile app. Click X to remove the grid. You can create new grids, add ones from the Grid Store and make changes in the Editor.

**Step 3**
Incoming Center is a useful grid. To configure it, click Settings. Use the sidebar to set up Email, Facebook, RSS, Skype, Twitter and TeamSpeak. Fill in your username/password and choose what info should be displayed. Power-Grid Settings lets you add, activate, deactivate or delete mobile devices.

www.magbooks.com
Control your Android phone or tablet using NFC

Take advantage of the new contactless technology built into your device.

If you’ve followed phone and tablet specifications in the last couple of years you’ll have heard of Near Field Communication (NFC), which is a technology that lets two devices communicate with one another at close range. Even if you’re not familiar with the term, the chances are you’ve had some experience using it. If you live or work in London, or travel around the capital on a regular basis, you might use an Oyster card on the tubes or buses. Or you might have made a small purchase using the contactless payment feature of your debit or credit card. Both of these are examples of using NFC technology.

However, what you might not have realised is that you can make use of NFC yourself, to automatically change the settings on your phone or tablet depending on where you are. As long as your device is NFC-compatible, it’s easier than you might think to set up.

What is NFC?

Near Field Communication is a short range wireless RFID (Radio-Frequency Identification) technology that uses interacting electromagnetic radio fields to allow compatible devices to transfer information when they come into close proximity. Unlike Wi-Fi, which has a range measured in tens of metres, and Bluetooth, which should work across a room, NFC’s range is rarely more than a couple of centimetres. Some NFC chips even require the devices to physically touch.

If you’re buying a coffee or some other item, and you want to pay using a contactless card (banks use ‘contactless’ or ‘tap-and-pay’ as a more friendly-sounding alternative to the name NFC), you’d just place your debit or credit card on the card reader, or bring it close enough to register, and the correct...
MINI WORKSHOP

Program a NFC tag using Trigger

**Step 1**
Launch the app and a bar of options appears. From here you can create tasks by clicking the plus sign or by going into My Tasks. The best way to get started is by selecting Suggested Tasks. This will let you try out the function using one of the ready-made examples.

**Step 2**
Pick a task. Options include Data Saver (turns off mobile data when you’re connected to WiFi), Bedtime Tag (silences your phone and sets an alarm) and Battery Saver (disables features when battery is low). On the next screen, select NFC as the trigger type.

**Step 3**
Separate an NFC tag from the rest (you don’t need to stick it in place yet) and put your device on top of it. The app will program the tag and you’ll hear a confirmation sound and see a message. You can now use that tag for your chosen task.

Attach these handy NFC stickers anywhere to send a location-based instruction to your device

RapidNFC has put NFC chips in all sorts of things

An amount of money will be automatically transferred from your account without you needing to enter your PIN. For security purposes, purchases made in this way are currently limited to under £20.

The NFC technology is embedded in a chip on the card, and it’s also built into some smartphones and tablets, which makes it possible to make payments using your phone in the same way as you’d use a contactless card. There are a number of UK trials underway, and if you’re interested you can check with your bank to see when they plan to offer this feature, and what devices it will be compatible with.

From what we’ve talked about so far, you might get the idea that NFC is only used to make (and receive) payments, but actually it can be used for all sorts of other tasks. With the right app you can use the technology to do certain things when you’re in particular location. For example, you can use NFC to turn off data and switch on Wi-Fi when you get home, turn the volume down and the ringer off when you get into work, and ensure you’re not disturbed by calls or notifications once you’re in bed. You can also use NFC to launch apps, open web pages or start a favourite song playing.

If you’ve ever fancied having your own theme tune that starts up the moment you walk into a room, this is the way to make that weird dream a reality.

For all this magic to work you’ll need to get hold of some NFC tags. Maplin sells packs of 12 RapidNFC stickers (in 6 colours – red, blue, yellow, green, black and white) for under £10 from bit.ly/maplin338. You can also buy tags from eBay and other similar places. Tags can programmed over and over again, so are fully reusable. The colour coding will help you remember what each tag is programmed to do. If you don’t fancy stickers, RapidNFC (rapidnfc.com) sells different types of NFC tags, in the form of wristbands, keyfobs, cards and tickets. Before you spend any money buying...
tags, however, you’ll need to make sure your mobile phone or tablet is NFC enabled. Provided it’s fairly new and runs Android, it should be (Apple iPhones and iPads don’t support the technology yet) but you can check by browsing the list of globally available NFC enabled phones and tablets at rapidnfc.com/phones. There’s also a full list of devices on Wikipedia (bit.ly/wikinf338).

Get the app
There are lots of free NFC apps available for Android in Google Play. One of the best, and our personal favourite, is Trigger (bit.ly/trigger338). The app is easy to use and lets you combine triggers and actions to create tasks that can be written to tags. Tapping your phone on a programmed NFC tag (or bringing it near enough to register) will run that task. The app even comes with a handy Activity Log that shows you when various tasks were last run, the total number of actions performed, and the action that have been performed that week. Find out how to run your own NFC tasks on the app by following our Mini

Workshops opposite and below.

Before you start
One thing it’s important to be aware of is that actioning a task is just a matter of tapping on a NFC tag with your phone (or tablet), but for the connection to be made, your device will need to be turned on, and the screen unlocked. The latter fact will obviously cause a degree of battery drain, so if you’re not happy with that, you’ll need to remember to unlock your phone before you tap on the tag, which will of course add another step to the process.

NFC, like Bluetooth, can be toggled on or off, and you’ll need to make sure it’s enabled before you can use it. To turn it on in Android, go to Settings and look for NFC under ‘Wireless and Networks’.

MINI WORKSHOP
Create your own Trigger tasks

Step 1
Trigger allows you to build your own NFC commands, so that you can get your phone or tablet to do just about anything with a simple tap. To construct your task, tap the plus symbol, then tap it again and select NFC as the Trigger type.

Step 2
Tap Next and tap the plus sign to choose some actions to add. Browse through the categories list. There are sections for Wireless & Networks, Bluetooth, Sounds & Volume, Display, Social Media, and so on. Tap next, and configure the action, if you need to.

Step 3
You can add a second task by tapping the plus sign. Trigger will automatically toggle between tasks every time your device comes into contact with the associated NFC tag. Tap done, and place your device over the tag to write.
Set up calendar alerts on your Android device

Use a free app to sync all your events and get directions to where you need to go.

Android devices are great for helping you to keep yourself organised, and the stock calendar app that comes with the operating system is pretty good. But if there’s one calendar app you should use on your phone or tablet in 2014, it’s Cal. The app automatically syncs with all the other calendars on your device and lets you create, edit and set notification reminders for events. You can create detailed events quickly and easily. Cal works with Google Maps to direct you to your location. It also syncs your friends’ birthdays from Facebook, so you never have to worry about missing a birthday again. Best of all, Cal is completely free – download it from Google Play (www.snipea.com/11024).

**STEP 1** When you open Cal for the first time, you’ll be given the option to import your friends’ birthdays from Facebook. Tap OK. If it’s your friend’s birthday, tap their image from the photos below and you’ll be given the option of sending birthday wishes via Facebook or email. Tap the Facebook option to post a message to that person’s wall. Tap the message icon to send a message via email. If it’s nobody’s birthday yet, tap on the birthday notification text to create a reminder.

**STEP 2** To add an event in Cal, tap the + tab at the top of your calendar. Set the start date, end date and time. Tap Add at the top to enter a description of your event. Cal syncs all your contacts from Gmail. You can add these individually by tapping the phone icon and typing their email address. The second option (pin-marker) lets you add a location by typing a postcode or selecting from a list of locations near you from Google Maps. The third option lets you add a note to your event, and the fourth option lets you repeat your event. Tap the red Bin to delete the event. Tap the small square to save the event and send an email about it to the Gmail contacts you added.

**STEP 3** When your event takes place, Cal syncs with Google Maps to give you accurate directions to the event’s location. Tap the Map using the pin marker to see your location in Google Maps with the option to Navigate or use Uber (a US taxi service – ignore this). Tap Navigate to open Google Maps and get directions to your destination. To add more accounts and change your settings, tap the menu button, then Settings. The Visible Calendars option shows you all the calendars on your device that are synced with Cal. The Default Calendar option lets you choose a default calendar. Click Show Birthdays to see all your friends’ birthdays from Facebook.
Set reminders in Google Now and never forget anything

Use Google’s handy personal assistant tool to set time or location-based reminders

Google describes Google Now for Android as an “intelligent” mobile personal assistant. It gives you customised information based on your location, browsing and usage habits, all displayed as ‘cards’ on your device. To access these, simply swipe left to right on your phone or tablet’s main home screen. One of its most useful tools is a reminder service that alerts you when and where you ask it to. In this workshop, we’ve used Google Now for Android 4.2.2 Jelly Bean (bit.ly/gnow328), but instructions will be the same for devices running 4.4 KitKat. Google Now is also available as an app for iOS devices, under the name Google Search (bit.ly/Rhs8G).

**STEP 1**
To enable Google Now on your Android device, open Google Search, tap Next and tap ‘Yes, I’m in’. Google Now uses location data to customise its content, even its background image. Swipe up to see ‘cards’ containing info based on where you are and what you do, such as news links and local weather.

**STEP 2**
Swipe up from the bottom of the screen to open a toolbar. Tap the dots to open Help or Settings, where you can toggle Google Now on and off. Tap the wand icon to customise or disable different cards and to set location preferences. Tap the hand icon to set and manage reminders.

**STEP 3**
To create a new reminder, tap the hand icon and tap ‘+’. Tap ‘Add a title’ and type a note, such as Buy milk. Choose whether to trigger the reminder by time (When) or location (Where). When is chosen by default. To choose a day, tap Today then tap Today, Tomorrow or ‘Set date...’.

**STEP 4**
To set a recurring reminder, tap ‘One-time’ and slide the Off switch to On. To set a weekly reminder, tap one or more days and tap Forever to set a time limit. To set a reminder for every few weeks, tap ‘1’ and choose a number of weeks.

**STEP 5**
To set a location trigger, tap and tap the location field. Tap a saved location or tap ‘Set location...’ and type a place. Tap ‘Remind me at this place/time’ to save your reminder, and Google will send you an alert as requested.

**STEP 6**
You can also create a reminder by speaking to your phone. Tap the microphone icon (or say “OK Google” if you’re using a KitKat device) to open the Speak now screen, say “remind me” and say what you want to remember, such as “collect tickets”, and when or where, such as “at the station” or “on Friday morning”.

Tap Repeat Weekly to change the frequency to Daily, Monthly or Yearly.
Maximise your storage

Find out how to successfully manage and expand your Android device's storage space.

In many people's eyes, one of the major failings of Apple's iOS operating system is that it doesn't provide any kind of file browsing ability. Without 'jailbreaking' the system (essentially hacking the software to gain root access to the system), there's no straightforward way of managing the raw data on an iPhone or iPad, as you might on a PC. But Android is different.

Without having to do anything as drastic as rooting your device, it is possible to browse through much of its file system and organise its contents to your heart's content. In this article, we'll show you what tools are available to help you manage the files stored on your Android device and explain your options for extending its capacity when things start to get a little tight.

Manage your storage

By default, Android's storage management tools are fairly basic. Head to Settings and tap Storage for a graphical representation of the apps, pictures and videos, audio and downloads stored on your device and how much storage each type is consuming. It's possible to claw back a little space by tapping the 'Cached data' entry here to clear out temporary files. Uninstalling unwanted apps is the next logical step, though many Android devices come pre-loaded with 'bloatware' that is unremovable.

To carry out further space-saving tasks, you will need a file manager app. In some cases, a file browser app of some description may have been included on your device already. Tap the Apps icon and look for an app named 'File Manager' or similar. If not, or if you would like to try an alternative, then you'll find no shortage of options available in the Google Play store.

Our favourite is ES File Explorer (www.snipca.com/9326). It lets you navigate through the various folders on your Android device's storage and open, delete, rename, move, copy or otherwise manage the files they contain. It's also possible to add network locations, for instance, providing a way to browse for and access files stored on other devices connected to your home network, such as your PC or NAS unit.

In ES File Explorer, first choose a location from the Change View button; this is the one in the top, left-hand corner of the screen. To browse files that are stored on the internal memory, for example, tap the Change View button and select Local. You will see several blue folders; tap one to reveal its contents or tap the Up button on the main toolbar to go up a level in the folder tree. Performing a long tap on any of the files or folders will open a menu of commands. Tapping the menu button, then Properties, for example, will provide information about the file's size and when it was last modified.

Other features are available by tapping the Tools button in the Change View menu. For instance,
tap Change View, then Tools, and select SD Card Analyst; this tool will list the folders on your device’s internal storage in order of size. Alternatively, tap Change View; then Tools, then App Manager. This lists the apps on your system in alphabetical order. Long-tap on an app and tap More, then Properties for more information.

**Expand your storage**

Many Android devices provide the ability to gain an instant storage space boost via an SD card. SD memory is cheap and easy to get hold of – a 16GB card should cost less than £10. It’s possible to store apps on SD cards but doing so can be extremely complicated and we don’t recommend it. For things like music and photo files, however, SD cards are ideal.

Unfortunately, not all Android devices can be expanded this easily. Many of the most popular phones and tablets, including the Google Nexus 7, offer a fixed amount of storage and no SD card slot. In some situations, the USB port can be used to expand storage. USB On-the-Go (USB OTG) is a system that allows external peripherals, including USB flash drives, to be connected. Often there are limitations on how external USB storage can be used. The Nexus 7, for example, treats USB OTG drives as read-only storage, though even this requires a special app called Nexus Media Importer (www.snipca.com/8331) to be installed. A special OTG-compatible USB cable is also required – these cost a couple of quid from Amazon. Jump through all those hoops and you can view photos and videos stored on a flash memory drive (or an SD card in a USB adaptor) but you still won’t be able to copy, move or write files from the device to the USB key.

**Get free online storage**

The alternative to adding physical flash memory is to use online storage instead. It makes sense to sign up to at least one of the many free cloud storage services available: Dropbox (www.dropbox.com), Google Drive (https://drive.google.com) or OneDrive (https://onedrive.live.com), for example. Again, you can’t store apps, but for photos and documents they’re ideal. ES File Explorer even provides the ability to integrate online storage locations so you can access your web-based folders just as if they were physically attached to your device. Find out how to do this in our Dropbox mini-workshop below. And, if you like listening to music but don’t want to fill up your device with MP3 files, then there are several solutions. Our preference is Google’s free Music service (http://music.google.com), which allows you to upload up to 20,000 songs to the cloud, then stream or download them to your device as and when you need them. You’ll find full instructions on how to set this up on page 97.

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**MINI WORKSHOP**

**use Dropbox on your Android device**

**Step 1**
Get Dropbox for your PC
If you don’t already have one, sign up for an account at www.dropbox.com and download the desktop application. With this installed you can drag and drop to Dropbox just like any other folder on your PC.

**Step 2**
Upload files from your Android device
Install Dropbox from the Google Play store and sign in. Tap the menu (three dots) button and select ‘Upload here’. Select ‘Photos or videos’ or ‘Other files’ as required, then tap files to select them. Tap upload to add the files to Dropbox.

**Step 3**
Integrate Dropbox into ES File Explorer
Install and launch ES File Explorer then tap the Change View button in the top-left corner and select Network, then Cloud. Tap New and select Dropbox, then enter your Dropbox log-in details when prompted and tap Sign In.
Send anything between PCs and Android devices

Transfer file and more between computers, phones and tablets

We've shown how to access files and folders on your device (page 64) but Pushbullet breaks down barriers further still by letting you move and sync not just files, but also web links, notifications and more between all your devices via Wi-Fi or mobile internet. The app was initially available for Android and Chrome, and it recently launched on Firefox too. Now there's a Windows version that lets you 'push' content to and from your PC without needing to open your browser. Pushbullet for Windows is still in beta, and there are problems to be ironed out. When we tested it, the EXE file was flagged as malicious by our anti-virus program, so we asked Kaspersky's virus lab to run tests and they confirmed that the software is safe. Pushbullet is working on an update, so keep an eye on the website for news.

**STEP 1**
Go to bit.ly/pushbullet341, click 'Click here to download the installer' and open the EXE file. Pushbullet launches automatically. Click 'Log in with Google' sign in if prompted, and click Accept. The Pushbullet website opens automatically in your default browser. Click 'Sign in' to log in online, again using Google.

**STEP 2**
Install the Pushbullet app on the device or devices you want to link to your PC. The free app for Android devices is available at the Google Play store (bit.ly/pushroid341). When you first open the app you'll be prompted to link it with your Google account.

**STEP 3**
To send a note from your PC desktop to your device, click the Pushbullet icon in the notification area. The program window contains a dropdown box which lists all your PCs and devices with Pushbullet installed. Select a device from the list, fill in the Title and Message fields, and click 'Push It'.

**STEP 4**
To send a web link from your PC to your device, select a device as before and click the link icon. Give the link a name, type or paste the URL, and click 'Push It'. You can also send a numbered list by clicking the list icon or send a map link by clicking the map icon and entering an address.
**STEP 5**
To send individual photos, videos and other files up to 25MB in size to your device, click the paperclip icon and select the file or drag and drop it onto the window. Alternatively, right-click the file on your PC and select ‘Send with Pushbullet’ to open it in the program window. Click ‘Push it’ to send.

**STEP 6**
The item is sent to your device instantly. It doesn’t even need to be on the same network. If you’ve enabled notifications for Pushbullet on your tablet or phone, you will get a message in your device’s notification area. You can enable Notification Mirroring in the app’s settings.

**STEP 7**
To view a received item on your device, tap it in the list on the app’s main screen. Links open automatically in your default browser but if you have more than one app for certain types of content – maps, for example – then you may be prompted to choose which app you’d like to use.

**STEP 8**
To send an item from your device to your PC, tap the bullet icon in the top-right of Pushbullet screen. You can send a note, clipboard text, a link, an address or a photo. Tap an item type to select it or select a file from your device. Tap ‘To’ to choose a device, fill in the text fields if you want, and tap ‘Push This’ to send.

**STEP 9**
When items arrive on your PC, you’ll see notifications at the bottom-right of your screen. Click a notification to view the item and dismiss the notification. Files open in their default program and are saved to your Downloads folder. Right-click a file notification to view it in Windows Explorer.

**STEP 10**
To edit the Desktop program’s notification settings, right-click the Pushbullet icon and select Settings. If you change your PC’s name, it will only apply in Pushbullet. Click to enable or disable notification options such as notification area pop-ups (‘Show notifications’) and notification sounds. Click OK.
Sync files with a PC automatically

Set up your computer and your Android device to automatically synchronise certain files and folders

Anyone who uses a tablet or smartphone and a PC will inevitably find themselves needing to access the same files – photos, music, documents and more – from both devices. As we saw back on page 64, there are ways to manually access files from one device on the other, either using a USB cable or wireless connection. And it’s also possible to sync files through a cloud storage service, such as Dropbox or Google Drive. But sometimes it’s preferable to have the files in question physically stored on both your tablet or phone and your PC. Luckily, there’s a way to have the best of both worlds. Here we’re going to explain some easy ways to keep specific files and folders automatically synced on an Android device and a PC.

**STEP 1**

Our aim here is to create a folder on our PC’s hard drive that will automatically synchronise its contents with our tablet over our Wi-Fi network, so we don’t have to fiddle around with USB cables or even remember to carry out a sync manually. Cheetah Sync is a free app that will do that. It comes in two parts – a mobile app that you can get from the Google Play store (www.snipca.com/10763) and a free tool for your PC that you can download from www.snipca.com/10762. Install them both.

**STEP 2**

Launch Cheetah Sync on your PC. If your firewall displays a message telling you it has blocked the program, click the option to allow it access. Cheetah Sync is accessible via its icon in the Notification Area. Right-click this and select Options. Check the name of your PC, listed under Hostname, and remember it for later. You can share an existing folder if you wish, but we recommend creating a special folder that you use just for synchronising things with your tablet or phone. Press Windows key+E and browse to the (My) Documents folder; right-click an empty space and select New, then Folder; and give your folder a name like ‘My sync folder’.
STEP 3  Now switch to your Android device and open the Cheetah Sync app – tap Tutorial if you wish to read this. Tap the Home icon in the top left-hand corner, then tap the Sync Jobs icon. Cheetah Sync will attempt to automatically discover your PC over your home network. You should see the Hostname from Step 2 listed under ‘Pick a computer to sync with’. Tap this, then tap Create Job. A directory will open – it should be the Documents folder on your PC and you should be able to see ‘My sync folder’ in the list 1. Tap it to open the folder, then tap the tick icon on the top right of the toolbar 2.

STEP 4  Next you’ll be faced with a directory showing the folders on your Android device. If you want to sync your photos, music or movies, then you could select one of these folders on your tablet. In this case we’re going to create a dedicated folder on our tablet where all our synced files will be stored. Tap the icon of a folder with a plus (+) sign in the top toolbar 1, then type a name and tap OK. Tap the new folder in the list, then tap the tick button in the top right. You’ll be faced with a screen of settings. Leave these as they are for the time being and tap Save.

STEP 5  Tap the Home icon (top left), then Settings. Tap Synchronization Interval 1 and select how often you want the sync to run – syncing frequently will consume more battery power. To test everything’s working, go back to your PC and drop a file into your ‘My sync folder’. On your tablet or phone, tap the Sync icon (two arrows in a circle), then tap Sync Now. Open a file manager app (try the free ES File Explorer from www.snipca.com/10767) and go to the folder you created in Step 4 – the file from your PC should be there. Your PC and Android device both need to be switched on for future automatic syncing to occur.

STEP 6  By default, Cheetah Sync only synchronises files one way – from your PC to your tablet or phone. If you prefer, it’s possible to reverse this so that it only syncs content from your Android device to your PC, or set up a bi-directional sync that keeps both folders the same, whether you change the contents on the PC or the tablet or phone. Tap the Home icon, then Sync Jobs. Select your computer, then tap the name of the job you set up and select Edit Job. Next, tap Sync Direction 1 and choose ‘Android to Computer’ 2 or ‘Two-Way’ 3 as required, then tap Save.
Camera, photos & video

The cameras built into tablets and phones aren’t just for taking selfies. We show how to take full advantage of them.

Once upon a time, cameraphones took photos that were so low-res you often couldn’t even recognise what they were supposed to be of. Nowadays, the built-in photo and video capabilities of the devices in our pockets rival those of many dedicated digital cameras and camcorders. But to get the best from your camera, you need to know how what apps to download and as well as which techniques to use. In this chapter we’ll be exploring not only how to take great snaps but also how to put your device’s camera to work in ways you may not have considered.

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Make the most of the camera that’s build into your Android tablet or smartphone

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Uncover an amazing array of alternative uses for your device’s built-in camera

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We compare six free video recording apps to see which ones are really worth using

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Apps that can transform your phone or tablet into a portable movie-editing suite
Take photos on your phone or tablet

Here’s how to make the most of the camera that’s built into your Android device, from capturing special moments to building panoramas.

To take photos, the process is straightforward: launch your device’s Camera app and hit the shutter button. You can leave it at that, shooting in automatic mode to your device’s memory and browsing the results using the Photos or Gallery app. But by acquainting yourself with the Camera app’s expert functions you’ll shoot much better photos and video clips. It’s worth pointing out that the functions available in the camera app can vary greatly from device to device. Some manufacturers, such as Sony, for example, include advanced camera apps with lots of special features, including 4K video recording, timelapse photography and more. But even the stock Android camera comes with lots of goodies to explore. More recent versions of Android, for example, offer various settings and modes to take advantage of. Here, we’re using a Nexus 5 running Android 4.4 KitKat but the options and instructions will be similar for other models and versions.

**STEP 1**
Open the camera app for the first time and you might assume that there aren’t many options available to you. That’s because Android hides a lot of its camera settings so that you can enjoy an uncluttered view of the scene you’re trying to line up. Slide your finger out from the left edge of the screen, however, and you’ll find a selection of five different modes: Photo Sphere, Panorama, Lens Blur, Camera and Video. Before we play with any of these, though, look for the little cog icon on the right. Tap this to access your camera’s core settings.

![Resolution & Quality settings](image)

**STEP 2**
There are three main categories of settings to choose from here: ‘Resolution & Quality’, ‘Save location’ and Advanced. Tap ‘Resolution & Quality’ first and you’ll see that each camera (front and back) offers settings for both photo and video resolution. If you want the best quality, tap each one to make sure that the maximum setting is selected. If space is more of a concern, however, then you could consider reducing the resolution for photos, videos or both. At the bottom here you’ll also find quality settings for Panorama Resolution and Lens Blur – tap these and adjust them as required.
**STEP 3**
Tap back when you’re done to return to the other settings. The ‘Save location’ slider can be switched on or off depending on whether you want to save geo-localisation metadata along with your photos – that’s to say snaps can be tagged with information about where they were taken, if you so wish. Tap the Advanced option and you’ll see a setting for ‘Manual exposure’. Tap the slider next to this if you wish to add manual controls to your camera or leave it switched off if you’re happy shooting in auto mode. Tap back when you’ve finished.

**STEP 4**
Back in the main area of the camera app, swipe out from the left again to reveal that list of modes. Let’s start with Photo Sphere mode. Tap this and the on-screen preview windows will shrink. You’ll notice a small circle in the middle of the image too, as above. Here, the goal is to pick the centre spot of a scene, and then fill more and more photos around it. Hold up the camera and align the first shot, then keep moving to the edges of the image and aligning the circle with the smaller dot to add more parts. When you’re done, tap the tick button to stop capturing. Open the Photos app and you’ll see a strange fishbowl-style view of your scene. If it doesn’t look right, try it again.

**STEP 5**
Now let’s try the Lens Blur option. The idea with this is to get a nice focused shot of your subject with a blurred background – similar to the effect you might get with a professional DSLR. In the camera app, swipe from the left and tap Lens Blur. Now line up your shot as normal. For best results, we recommend taking a fairly close-up shot of your subject, like the one below. Tap the shutter button and you will be prompted to raise your device whilst keeping your subject centred. Do so, then head to the photos app to view the results. If you set Lens Blur to best quality in Step 2, it may take a while to process the results.

**STEP 6**
In addition to the modes offered, the camera app provides a number of other options to explore. Swipe out from the left and set the app to standard Camera mode. Then tap the Menu (three dots) button in the top right corner of the screen. Four options will drop down here. In descending order, these allow you to switch between the rear and front camera, turn the flash on and off, switch HDR+ mode on or off, and turn gridlines on or off. Gridlines are very useful for lining up your shots. Google claims that shooting in HDR+ mode provides more vivid photos during the day and sharper photos at night, so it’s well worth experimenting with.
Secret tricks for your camera

The camera on your phone or tablet isn’t just for taking pretty pictures. We reveal nine other ways to use your device’s camera.

Set up a surveillance system
If you’ve got a spare Android phone or tablet (running 1.2 or later), you can turn it into a home-surveillance camera using IP Webcam (bit.ly/webcam333). Set the device up at home and you’ll be able tune into the live stream from wherever you are, via Desktop software, over the web or from another phone. You can adjust the app to broadcast a low-resolution stream if you want to save your phone’s battery, or choose higher resolution if your phone is plugged into the mains.

Bambuser (bit.ly/bambuser333) takes a more fun approach to live streaming. It lets you set up your phone as a webcam at a party and ‘invite’ friends and family to a live interactive video stream online. You can make the stream public or private and share it on Facebook.

DroidCam Webcam (bit.ly/droidcam333) works over Wi-Fi or USB and lets you record high-quality interactive webcasts using your phone’s camera and microphone, but you need to install PC software too (get it free from www.dev47apps.com).

Catch a phone thief in the act
Here’s another way to protect your security with your camera: snap a thief. Free app LockWatch (bit.ly/lock333) emails you with a photo and GPS location whenever someone tries to unlock your Android with the wrong code. The photo is shot silently and invisibly with the front camera, and the app starts automatically when needed, so that you don’t have to leave it running all the time. Its better-known rival GotYa (bit.ly/gotya333) costs £1.99 and emails you a Google Maps link as well as a photo.

See things that your eyes can’t
Augmented reality (AR) is a non-catchy name for a very catchy idea: it basically means seeing invisible things. AR apps Junaio (bit.ly/junaio333) and Layar (bit.ly/layar333) use your phone’s GPS to reveal things that you can’t see with your naked eye, such as the nearest cashpoint or parking space, and even non-physical items including shop discounts and local events. Just point your phone’s camera at your local high street, and the app will overlay useful information on whatever is in the viewfinder.

Gaming apps have been quick to exploit AR’s potential. BallStrike (bit.ly/ball333) is a Wii-like app that keeps you fit by throwing virtual balls into your screen and making you kick them out of the way. The Android games SpecTrek (bit.ly/spectrek333) and Zombie Run (bit.ly/zombie333) challenge you to get from A to B on a map of your real surroundings while you point your phone at ghosts, zombies and other made-up miscreants. You’ll get some funny looks in the street, but they’re both great fun. As one Play Store comment puts it: “it’s like a real-life Pac Man”.

Plan your dream home
Have you ever wished you could take your sofa to the DIY shop so that you can choose paint to match? The free
Let’s Paint app from Dulux (bit.ly/dulux333) lets you do the next best thing: take a photo of your sofa and get an instant match to a paint product or colour scheme. You can then order paints or testers through the app for home delivery.

Augmented reality is an increasing common element of DIY apps. Floor Plan Creator (bit.ly/floort333) and Homestyler Interior Design (bit.ly/styler333) use AR to help you plan your ideal home by letting you capture your room in 3D and add virtual items. If you don’t like the result, you can get your old room back in the swipe of a finger. Check out a YouTube video of Floor Plan Creator in action at bit.ly/floortube333.

Save money on high-street shopping

Next time you’re standing in a shop wondering whether to buy an item, fire up Barcode Scanner for Android (bit.ly/barcode333) and scan the product’s barcode with your phone’s camera. This will bring up a host of product reviews and even tell you if the item is available cheaper elsewhere.

Similar apps include RedLaser (bit.ly/red333), which also lets you scan and store loyalty cards and set up wish lists, and QuickMark (bit.ly/mark333), which works in conjunction with a Google Chrome browser extension for easy online shopping on the go or from your Desktop.

One camera-shopping app that remains on our wish list is Amazon Price Check (bit.ly/amcheck333), which lets US shoppers check prices by photographing products. Sadly, Amazon has yet to launch a UK version, but it’s one to watch for.

Digitise your documents

Check out your filing cabinet and go paperless with CamScanner (www.camscanner.net), which turns your phone’s camera into a powerful document scanner. You can merge, tag and annotate your scanned documents to make them easier to file, and the text is all searchable thanks to OCR (optical character recognition) technology. The app is free for Android and tablet devices.

Digital Receipts (bit.ly/receipts333) turns your scrunched-up shop receipts into digital files that you can search, stitch together and convert into expense reports, and Handy Scanner (bit.ly/handy333) converts your scanned documents or photos into printable PDFs which you can share by email or save automatically to Dropbox.

Illustrate your notes

Add the power of pictures to your mobile notes to give you a visual as well as written record. Fast Photo Notes (bit.ly/notesc333) lets you annotate photos you take using the app and images your gallery, organise them into lists or panoramas and export them in various formats.

The photo-notes tool in Evernote (www.evernote.com) is one of its most useful features. Photograph anything that contains text, such as an event poster, train timetable or magazine article, and Evernote will automatically recognise the text and make it searchable. Your camera and Evernote effectively work together to write notes for you.

Scan negatives with your phone

Bring your old 35mm photo negatives to life with the Helmut Film Scanner for Android (bit.ly/helmut333). You don’t need any expensive hardware, just a uniform light source to photograph the negative against. A bright window does the job, or a blank white page on your computer screen, with the brightness turned up. Edit the scanned photo using Helmut’s built-in tools, or upload it to your computer to edit it there.

Search Google using photos

Google Goggles (bit.ly/googles333) is a handy tool that lets you search Google with a photo of something (a product, painting, plate of food or whatever), and it also does some of the jobs that we’ve listed above, such as reading barcodes and converting scanned text with OCR (optical character recognition) technology.

But Goggles’ most impressive tools are less obvious. It can recognise famous landmarks and book or DVD covers, add people to your contacts if you scan their business cards, solve Sudoku puzzles and even act as an interpreter. Hover your camera over an image of some text and, if it’s not in your default language, Google will give you a translation. Very useful if you’re looking at a restaurant menu on holiday!
Best free apps for recording videos

There are lots of apps for recording, editing and sharing short videos on your phone, but are they just for teens? We compare five free tools

Vine

Vine's simple 'tap, hold and record interface' is a joy to use, as are its built-in sharing options for Twitter (which owns the app) and Facebook. Instagram may add Tumblr and Foursquare, but Vine has the ones that count.

Its six-second-or-under limit for videos may be less generous than Instagram's 15 seconds and MixBit's 16, but it focuses the mind beautifully while the others can make you think too much - especially MixBit, which allows you to combine up to 256 16-second clips.

Although Vine lacks Instagram's filters and MixBit lets you edit, trim and combine clips to make 'proper' movies, you can save a video for later and perform simple edits by dragging and dropping captured sections into different positions on the thumbnail storyboard. Vine has also just added a clever Time Travel option, which lets you remove and replace any shot within a video before you share it.

Vine lets you tag your videos with a location and send them to a specific channel (Music or Comedy, for example). We particularly like the way you can 're-Vine' a video to your followers, Twitter-style. Vine saves videos in MOV format and makes it easy to embed them in a blog or web page, as well as sharing them on social media.

HOW CAN IT BE IMPROVED?
Vine's sharing screen shows services you haven't connected to yet, which we think should be greyed out. Its focus feature could be easier to use, and we'd like the ability to add a soundtrack from your music library.

OUR VERDICT
Vine's greatest strength is that's stuck to the original concept of sharing short videos, rather than adding unnecessary tools. And it lets you share clips with the people and services that matter.

RATING: 4
The most notable aspect of MixBit, which was developed by two of the YouTube team, is undoubtedly its length. It lets you capture up to 16 seconds of video at a time but supports movies of up to 256 clips, so you can trim, delete, assemble and arrange recordings in a much more sophisticated way than Vine or Instagram allow. Sign up to the service and you can also mash up your videos with those of other MixBit users. Clips are handily colour-coded and it’s possible to import existing videos and photos from your device to create a personalised front page. Unlike Vine and Instagram, with their old-fashioned square-frame video, MixBit supports proper 16:9 widescreen, which makes it ideal for capturing landscapes or concerts. You can also post to various Mixbit streams – Public, Limited and Draft and, as with the other apps, share videos on Facebook and Twitter, and via email or by text (which basically embeds a URL in the message).

**HOW CAN IT BE IMPROVED?**
Despite the latest update, the interface is a bit confusing and the ability to stitch clips together turns it into more of a conventional video app: the most recent version is also less responsive than before, making video capture a bit hit or miss.

**OUR VERDICT**
MixBit strays into ‘proper’ video editing a bit too much for our purposes and it’s not as straightforward to use as Vine or Instagram.

**RATING: 3**

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**Recommended**

**Snapchat**
bit.ly/1dp63TD
The main appeal of SnapChat is that your videos (and photos) are sent to a specified list of recipients and then deleted automatically one to 10 seconds after they’ve been viewed. It’s not particularly sophisticated as a recording tool, although you can overlay notes and scribbles, but the kids seem to like it.

**Pheed**
www.pheed.com
Pheed offers unlimited video, photo and audio sharing with no time limits. Unfortunately, in its desire to set itself up as your primary (even only) social network it’s treading on too many powerful toes, such as Facebook and Twitter. It’s an interesting app though, and is worth a look.

**Instagram**
www.instagram.com
The king of photo-sharing apps added video last year. Shooting movie clips isn’t as smooth as with Vine, which takes away some of the immediacy. We like that you get 13 filters and the ability to choose a ‘Cover Frame’. Video length is limited to 15 seconds, and you can share clips on Twitter, Facebook and via email, as well as Tumblr and foursquare.
Edit video on your phone or tablet

Turn your smartphone or tablet into a portable movie-editing suite using this easy Android app.

Traditionally speaking, video editing is usually done by first transferring your footage to a computer, but a new app called WeVideo (bit.ly/wevideoto340) cuts out the middle man by letting you trim, stitch and render your videos directly on your Android device. The app’s main aim is to get you to stitch various different video clips and photos together to create compilation videos with titles, captions, filter effects and soundtracks. But it’s just as useful for simply trimming a video and saving the newer, smaller version to your Gallery. The app automatically saves work in progress and lets you export up to 5GB of video to the cloud for free, using a WeVideo account. There’s also a Chrome web app (bit.ly/wevideoweb340).

**STEP 1** The first time you open WeVideo on your Android, create an account so that your videos are automatically saved in the cloud. The app will prompt you to record a new video. To skip this and get to the videos already on your phone, tap ‘Create new’ and tap Continue without typing in a title.

**STEP 2** The main WeVideo screen opens next, with thumbnails of your videos at the bottom. Slide in from the right to see all your photos. To link several videos and photos together to create a video project, long-tap and drag their thumbnails into the timeline box. Long-tap to move them around.

**STEP 3** To edit your project’s title screen, tap the title thumbnail, tap in the caption box, type a title, tap the back button and tap Save. To remove the title screen altogether, tick the ‘No Title For My Video’ box. Tap a video or photo thumbnail in the timeline box to open it in the video or photo edit screen.

**STEP 4** To trim a video, drag the left arrow to where you want the video to start and the right arrow to where you want it to end. To set a photo’s duration, tap the plus and minus icons. Default duration is six seconds. Tap Save, or tap the grey arrows to edit the next video or photo in the timeline.
STEP 5

The Caption option on the video or photo edit screen is only available if you’ve added a theme (filter) to your project. To add a theme, tap the wand icon and swipe through the available options. The currently selected theme has a grey frame. 1 Tap Apply Theme to add it to your project.

STEP 6

You can also record new clips while you’re creating your project. Tap the dots and tap Record. Tap the filter icon (1) or the dots (2) to set your recording preferences. Tap the camera icon to record, and Rec to stop. Tap the tick icon to add it to the end of your project, or the arrow icon to record again.

STEP 7

To add a soundtrack to your project, swipe the Videos and Images headers to the left until you see Audio. 1 Tap a song or other audio file to select it. To adjust the volume, tap the volume icon, move the slider and tap Apply. To preview your project, tap the green arrow. The number next to it is your project’s duration.

STEP 8

Your project plays in landscape (horizontal) mode, and if you’ve recorded video in portrait mode they won’t be cropped to fit. 1 Tap the screen to bring up controls including pause/play and running time. 2 Tap the Back arrow (3) to return to your timeline. Your work in progress is saved automatically.

STEP 9

To export your project as a video file, tap the upload (arrow) icon. You can upload to WeVideo, Facebook and/or YouTube depending on how you signed in. 1 Tap the lock icon to choose a privacy level, 2 and tap Gallery to save a copy to your phone. 3 Tap Publish. 4

STEP 10

Choose a video quality. You can upload and store unlimited video for free at Standard Definition (480p) 1 with WeVideo branding, which is the default. High Definition exports cost 61p (720p) 2 or £1.22 (1080p) 3. Tap Continue to let WeVideo render your video. You can continue editing your project.
Chapter 6
Entertainment & fun

Whether you enjoy music, movies, books or TV, we show you how your phone or tablet can provide endless hours of fun.

Your Android phone or tablet is the ultimate entertainment device. Not only is it a portable web browser and games machine, but you can use it as an ebook reader or a portable music player. You can stream TV and movies to it and catch up on episodes of favourite programmes you might have missed. Or what about going the other way and getting what’s on your Android device onto your TV screen? You can do that too and we’ll show you how. This chapter’s all about having fun with your device, so get comfortable and let your tablet or phone entertain you.

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We reveal the best new ways to enjoy music, movies and TV shows on your Android device.

97 Transfer music from your PC to your Android device
Sync songs with your computer or upload your music library to the cloud for free.

100 Use your Android tablet as an ebook reader
Get free apps that can turn your tablet into a fully-fledged ebook device.

102 Get Android on your TV
Find out how to view videos, apps, games and more on your living-room screen.

105 Keep a diary on your phone or tablet
Convert your tablet or phone into a portable digital diary using a free app.
Stream music, films and TV

We reveal the best new ways to enjoy music, movies and TV shows on your Android device

More and more of us are now forsaking CDs and DVDs to stream all our entertainment from the web. Not only is the choice of songs, films and TV shows available on-demand growing all the time, but so is the range of streaming services. This means that if you don’t fancy any of the programmes on Netflix, there are plenty of alternatives to try, while free trials mean you can shop around as much as you like.

By combining the convenience of streaming with the portability of your tablet or phone, you’re effectively turning your device into the ultimate entertainment centre. In this feature, we take a closer look at the latest online streaming services and apps available for Android devices.

**MUSIC & RADIO**

**Rdio**

www.snipca.com/12239

The music-streaming service Rdio (www.rdio.com) has a library of more than 20 million songs, which you can listen to across all your devices. There’s an Android app but subscribers can also listen via a browser, Windows and Mac desktop player, iOS or Windows Phone device. There’s a range of subscription plans to choose from, starting at $10 per month but you can get a fortnight of unlimited streaming free if you download the Android app.

**Earbits**

bit.ly/earbitsandroid331

Earbits (earbits.com) is an excellent free online music service that champions independent artists. The new Earbits Free Radio app analyses the music on your device and recommends channels that match your tastes, from the 400 genre-based selections on offer. The app intelligently blends your own music with tracks from those channels, so you should enjoy the results even if you’ve never heard of the artists. Earbits has no adverts and no subscription fees, either, so it’s a great way to discover new songs while listening to some old favourites.

Watch films on Tesco’s Hudl

Tesco’s excellent value Android tablet (www.tesco.com/direct/hudl), which we reviewed on page 38, costs just £119 but can be bought for even cheaper using Clubcard vouchers. While the Hudl is no Nexus 7 or iPad Mini, it’s not a bad little device and comes with Blinkbox and Clubcard TV built-in. This means you can stream the latest TV series and films from those services without having to install anything, and enjoy classics such as The Shawshank Redemption and Sliding Doors. You can see what’s on offer through Clubcard TV on the website (www.clubcardtv.com).
Torch Music
www.snipca.com/12240

Torch Music (music.torchbrowser.com) is a music-streaming service that’s designed to be used with Torch Browser (www.torchbrowser.com), but also works with Internet Explorer, Firefox, Chrome and Opera. There’s a free Android app available, too. When you search for songs, albums and artists, or select one of Torch Music’s suggestions, the service will find a video for that track on YouTube. You can create playlists from your favourite tracks.

Google Play All Access
bit.ly/googleallaccess331

All Access is a new subscription service from the search giant, which lets you discover, play, store and share music on Android devices and the web. For £9.99 per month, you can enjoy unlimited streaming of millions of songs to your phone or tablet via Wi-Fi or 3G/4G. You can create personalised radio stations, get recommendations based on your musical tastes and upload 20,000 tracks from your own collection (including iTunes and Windows Media Player libraries) to an online ‘locker’ to listen to anywhere. Google All Access offers a free 30-day trial, so you can take it for a spin before committing yourself.

Xbox Music
www.snipca.com/12241

Despite the ‘Xbox’ in the name, you don’t need to own Microsoft’s games console to listen to songs through the new Xbox Music Web Player (music.xbox.com). Just sign in with a Microsoft account (or sign up if you don’t have one) and find some songs to play. Initially, you’ll be able to enjoy unlimited (ad-supported) listening, but this will be reduced to 10 hours a month after six months. Alternatively, signing up for an Xbox Music Pass for £8.99 per month gives you unlimited, ad-free streaming to your Android device via a free app. You can listen on other devices too (including Xboxes) and music is synced across devices. You can try the service for 30 days for free, although you’ll need to enter your card details.

MOVIES & TV

Wuaki.tv
www.snipca.com/12242

The oddly named Wuaki.tv (uk.wuaki.tv) is home to the latest big name movies, as well as slightly older films such as 28 Days Later and Night at the Museum. You can rent or buy movies in either Standard or High Definition, although you’ll pay slightly more for the better quality versions (usually £4.49 compared to £3.49), and there’s a special ‘I only have 90 minutes’ selection of shorter, cheaper films. Wuaki also offers more than 120 popular TV series including Homeland, Frozen Planet, Downton Abbey, Outnumbered and Mrs Brown’s Boys.

One of Wuaki’s main strengths is the variety of devices you can stream to, with free apps available for not only Android devices, but also iPhones, iPods, Xbox 360 and smart TVs made by Samsung and Panasonic, as well as through your browser. If you like the service, you can sign up for the subscription plan Wuaki Selection, and get unlimited access to the best films and shows for £4.99 a month. There’s a one-month free trial available.

Netflix
www.snipca.com/12247

Netflix has recently announced a price hike for its flat-fee unlimited service from £5.99 to £6.99 per month, though existing customers will continue to pay at the old rate until 2016. New customers get a month’s worth of the service for free when they sign up and they can also elect for the cheaper £5.99 subscription fee if they choose SD-only streaming over high definition. There’s no doubt that there are many more contenders when it comes to streaming movies and TV these days, but Netflix is still home to some of the best.
How well does your ISP stream Netflix?

If you’re not happy with the streaming quality you receive from Netflix (www.netflix.com), you can find out whether the problem lies with the service itself or with your ISP. Netflix offers an ISP Speed Index (www.speedindex.netflix.com), which shows you which broadband providers deliver the best streaming experience. To compare yours, go to the site and select UK from the drop-down menu. The index will list the top choices and the average speed they offer, in Mbps. You can check the archive to see how your ISP has fared over previous months — this is handy if you suspect your provider has been throttling your streaming traffic.

exclusives, including House of Cards. See the box above for some troubleshooting advice if you’re having problems with Netflix streaming.

Blinkbox
www.snipca.com/12246

Tesco’s video-streaming service Blinkbox (www.blinkbox.com) is definitely worth checking out as an alternative to Netflix. Apart from anything, it’s currently offering all new customers £5 of credit to spend on TV shows and movies. You need to deposit £1 to claim this offer and use your credit within 31 days.

Blinkbox has a great selection of films and TV series and, unlike rival streaming services, you only pay for what you want to watch, with no monthly subscription to worry about. Current best sellers include Anchorman 2 and The Wolf of Wall Street. Both cost £3.49 to rent (£4.49 in HD), which means you can stream them for free using the £5-credit promotion.

iPlayer
www.snipca.com/12248

The BBC’s next-generation iPlayer service (www.bbc.co.uk/iplayer) is expected to launch sometime in 2014, with some great new TV-streaming features. The updated categories such as ‘Popular on Play’, ‘Best of the BBC’, ‘Retro TV’, ‘Top Comedy Shows’ and ‘Period Dramas’. Prices for individual episodes cost £1.99, with many available in HD for an extra 50p, and you can purchase full ‘seasons’ where available, too.

TVCatchup
www.snipca.com/12243

A recent high-court ruling stopped the much-loved live-TV service TVCatchup (www.tvcatchup.com) from streaming some channels from ITV, Channel 4 and Channel 5 through its website and app. But you’ll be glad to hear that these channels are all back on board and TVCatchup is hoping to boost its selection with additional broadcasters and introduce HD content in the near future.

4od Collections
www.snipca.com/12244

The 4od app for Android now offers a helpful feature called Collections, which has been available for a while through the website. Collections are compilations of TV shows that share a common theme or subject matter, as handpicked by 4od. Examples include Animal Kingdom, Very Odd Couples and The 80s Collection. Collections are free to stream, although you will have to put up with adverts.

Google Play TV
www.snipca.com/12245

If you’ve got an Android device, you can now buy episodes of popular TV shows directly through Google Play. Programmes are sorted into straightforward
Transfer music from your PC to your Android device

Syncing songs between your computer, smartphone and tablet is easy

Here are several ways to enjoy music on an Android device via streaming services, such as Spotify, or internet radio apps. But if you already have a large library of music on your computer's hard disk, you will probably want to know how to go about transferring some or all of it to your portable device. Unlike iPhones and iPads, which rely on iTunes to sync music, Android devices allow for a number of different methods. In this workshop, we are going to demonstrate how to perform a simple sync using Windows' built-in tools, but we will also explain how to use Google Music to upload your music to the cloud and sync selected tracks and playlists. Finally, we'll show you how to transfer songs to your device wirelessly. Note that these procedures may not work with DRM-protected music files.

**STEP 1**

The no-frills method of transferring music to your Android device would be to plug it into your PC via USB, then open two Explorer windows. In one, navigate to the folder on your PC where you store your music (C:\Users\Username\My Music by default) and, in the other, open your Android phone or tablet and navigate to the Music folder. Now, drag and drop the raw music files you want from the PC to the device. You can drag and drop entire artist or album folders, if you like. If you see a warning message like the one shown, put a tick in the 'Do this for all files' box and click Yes.

**STEP 2**

Anyone who already uses Windows Media Player (WMP) as their main music player may find it slightly easier to get tracks onto their Android device by plugging it in via USB, then opening WMP. On the left-hand side, click on Library and then Music. On the right-hand side, click on the Sync tab. Your Android device should be listed here. To transfer tracks, browse your library and drag individual songs or albums over to the Sync pane. When you're done, click the Start Sync button to load the items onto your device. This method has some notable limitations. Playlists cannot be synced and tracks cannot be removed from your device, for example.
Another option is Google Music, which lets you upload an entire library's worth of songs (up to 20,000) to the web at no cost and then stream or download tracks at will. Unlike the previous methods, Google Music's key advantage is that it can synchronise playlists that you have already put together in either WMP or iTunes. Head to http://music.google.com and sign in with your Google account. If you're using Chrome, you can click Add Music and drag and drop songs to upload them. If you're using Internet Explorer or Firefox, click the Upload Music button on the right-hand side of the screen. On the next screen click the Download Music Manager button and run the downloader.

At this point, you can either allow the Google Music Manager utility to automatically upload your whole library (or 20,000 songs of it) or select specific playlists to upload. If you follow the latter route, put ticks next to all the playlists you require and click Next again. You will be asked if you want to automatically upload songs that you add in the future. Select Yes or No as required. Follow the remainder of the prompts until the upload begins. This can take a while if you have a large collection and your internet connection may run slowly. You can check its progress by right-clicking on the Music Manager icon in the Notification Area.

Once downloaded, the Music Manager setup utility will launch automatically. You will be asked to sign in with your Google account details. Do so, then select the 'Upload songs to Google Play' option if prompted. Then, when the utility asks you where you keep your music files, select iTunes or Windows Media Player if you use one of these programs to organise your library. If not, select the My Music Folder option if that's where you keep your music files or choose the Other Folders option, then click Add folder and browse for the location of your music. Click Next and the program will scan for music.

At this point, you can either allow the Google Music Manager utility to automatically upload your whole library (or 20,000 songs of it) or select specific playlists to upload. If you follow the latter route, put ticks next to all the playlists you require and click Next again. You will be asked if you want to automatically upload songs that you add in the future. Select Yes or No as required. Follow the remainder of the prompts until the upload begins. This can take a while if you have a large collection and your internet connection may run slowly. You can check its progress by right-clicking on the Music Manager icon in the Notification Area.

Open the Play Music app on your phone or tablet (or install it from Google Play). Tap My Library to browse albums or Playlists. If the app says 'On device' on the top toolbar, tap this and select 'All music' instead. You can browse and play songs in the cloud as long as you are connected to a wireless network. We recommend using Wi-Fi, since you may be charged for data usage by your mobile provider if you listen via 3G. Songs, albums or playlists can be downloaded to your device by tapping the Settings (three dots) button followed by 'Keep on device'. Tap on the drawing pin icon next to anything you want to transfer.
Yet another solution would be to synchronise music wirelessly between your PC and your Android device. Most of the music apps that do this cost money. But SyncMe Wireless is a free app that lets you wirelessly log into your PC from your device and access your PC's folders and files. You can then copy these files from your PC to a virtual clipboard and paste them on to your device. All you need is for your PC to be switched on and for your PC and Android device to be on the same Wi-Fi network. Download SyncMe Wireless on your device from www.snipca.com/11392.

**STEP 7**

Launch the app and click Add Computer in the Startup screen. Tap Computer Name at the top. The app will scan for PCs on the same Wi-Fi network. Tap the down arrow to close the notification box. Select your PC and return to your previous screen. The domain name of your PC will be added. Tap User and enter the username of your PC. Tap the back button, tap Password and enter the password you use to log in to your PC. Tap OK to validate. You can now access your PC over Wi-Fi.

**STEP 8**

Tap the name of your PC and tap ‘Add sync folder’. ‘Device folder’ displays folders on your device and ‘Computer folder’ displays the media folders and sub-folders on your PC. Tap ‘Computer folder’ and navigate to the folder you want to copy your music from. Tap the top-left Back button if you want to go to the previous folder. You’ll see all your music files with a Google Play icon on them. Tap a song and select the app you want to play it from (if you have more than one music app on your device). Tap the track to preview it.

**STEP 9**

Tap the checklist icon at the top to get tickboxes beside each track. Tick tracks you want to copy to your device. Tap the copy icon at the top. It will turn into a clipboard icon. Tap this icon to copy tracks to your clipboard. This will take a while depending on how many songs you’ve copied. Tap Back, go to your Device folder, tap the Music folder and then tap Download to copy the music from your clipboard to your Android device. You can access these music files from any music app on your device. Videos and photos work in the same way, although there’s no preview option.

**STEP 10**
Use your tablet as an ebook reader

Why buy a separate ebook reader when you can easily convert your Android tablet into one for absolutely no cost? We explain how

Ebooks are a perfect match for tablets. Rather than having to carry a bundle of paperbacks with you on holiday, you can store as many weighty tomes as you like on your tablet, so they’re ready to read whenever you want. Most ebooks are created in standard file formats, and all it takes to turn a device into an ebook reader is a suitable app. In this article, we will explain the basics of downloading and reading ebooks on Android devices, looking at the best apps to use and showing you how to get ebooks.

Once upon a time
Before you start, it is worth checking which apps bundled with your device. Some manufacturers, such as HTC, include the Kobo ebook reader with tablets. Those apps usually include a bookstore where you can buy ebooks and there may also be a selection of free titles available (see bottom right for other sources of free ebooks). There is no problem having several reader apps on your device – they won’t interfere with each other.

Let’s start with one of the easiest options. The Amazon Kindle may be well known as an ebook reader device, but not everyone realises that the free Amazon Kindle app can turn almost any tablet device into an excellent ebook reader – even if you don’t own a Kindle device. And, of course, Amazon’s Kindle Fire HD is itself an Android tablet, at heart.

The Kindle app for Android can be found at www.snipca.com/X3417. Kindle makes it easy to buy ebooks from the Kindle store and there is also a Popular Classics section containing free ebooks.

After installing the app, enter your Amazon account username and password (you can create an account by tapping the link on the opening screen) and it will download any purchased ebooks, and keep them synchronised on all devices running the software, including computers. However, this app cannot import your own PDF files, or Epub files bought from other places; Epub is a popular format for ebooks and the files have a .epub file extension.

The reading experience in the Kindle app is good. Tap the left or right edge of a page to navigate, or tap the centre of the page to open the settings and display adjustments.

Beyond Amazon
If you don’t fancy the Kindle selection – though it’s one of the biggest out there – then it’s worth looking at Kobo Books. Kobo runs the ebook store for WH Smith in the UK, and you can browse the selection at www.kobobooks.com. A little like Amazon, Kobo has both dedicated ebook readers, and apps. In fact, the Kobo Arc ‘multimedia’
readers are actually just Android tablets.

If you have a tablet or a smartphone, download the Kobo app from Google Play. It doesn't have the fancy page-turning animations of some apps, but it works well, and includes features to share what you're reading on Facebook, recommendations for books you might like, and the Kobo store is built in.

Kobo has some handy features. You can use the volume keys on a device, besides tapping the screen, to turn the page. And your reading position is synchronised, so you can read in bed on an Android tablet, then catch up using your phone on the way to work, or pick up the same book on a Kobo reader and each time, it will take you to the last page you read, whichever device you were using.

Over the last year, Google has been busy adding more items to the Play store, including a bigger selection of movies and music, and plenty of books. When you launch the Play store app you will find a books section, with a pretty decent range of titles available to buy - in fact, in our experience, even if you do use another store, such as Kobo, most of the time, it's worth checking for special offers, or comparing prices. Many ebooks are sold at a price fixed by the publisher, though you can sometimes find that one store is cheaper than another, or has a special promotion.

Google's app, listed as Play Books on your device in the Apps folder, will automatically download books you buy from the store, and allows you to save books you've bought in the common Epub format, so they can be transferred to a reader that doesn't have built-in Wi-Fi - though you will need an Adobe ID in that case, to unlock the digital protection of the book before it can be read.

Other readers
There are plenty of other apps for reading on Android, too. One of the best free ones is Aldiko (www.snipca.com/3x424). This looks like Apple's iBooks and it too has a built-in store, though it is not as large as Kobo or Google (tap on the shopping basket icon at the top right to open this). The store also has links to some other ebook sites such as Feedbooks.

Aldiko can open PDF or Epub files stored anywhere on the device. At the main screen, tap the home icon at the top left, then tap SD card. This lets you browse the contents of the device to find ebook files you have downloaded or transferred from a PC. When you locate a file, tap it and Aldiko will prompt you to open or import it - once imported, it will appear in the Aldiko bookshelf.

It is easy to transfer files from a PC, and if you have bought any PDF ebooks using Adobe DRM, these can be copied across and imported into Aldiko. Press the Menu button, choose Settings, tap Adobe DRM and enter the Adobe ID and password that you used to buy the ebooks. Now you can copy Adobe DRM-protected files to the device and import them into Aldiko. The app will also work with ebooks borrowed from your local library.

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You can also download free ebooks from websites to your PC or device. Project Gutenberg is the biggest (www.gutenberg.org). Another with lots of free ebooks is Feedbooks (www.feedbooks.com). Click the Public Domain link to browse and download these in Epub format. The Kobo and Kindle stores also offer free books to download.
Get Android on your TV

Find out how to view videos, apps, games and more on the big screen

Google's Android operating system is primarily used on smartphones and tablets, but is versatile enough to also form the core of games consoles like the Ouya (www.ouya.tv) and set-top boxes. The beauty of Android-powered devices is you can do all sorts of cool things with them, including beaming content directly to your TV. You can take a photo or record a short video on your mobile, or download a TV programme or movie on your tablet, then you, and your friends or family, can enjoy it on the big screen. Here's what you need to do.

Plug it in
SlimPort is a technology that lets you connect your smartphone or tablet to a compatible TV or PC monitor, allowing you to watch high-definition video on a suitably large screen. It's included as standard in certain newish Android devices including the new Nexus 7, the Nexus 5 and the LG G2. It requires very little power, so won't eat up any more of your phone or tablet's battery life than if it were just playing a video on its own screen.

To make use of the feature you'll need a SlimPort HDMI Adapter. This consists of a micro USB connector at one end, which plugs into your mobile device, and an HDMI port at the other, which connects to your TV.

You can buy a SlimPort adaptor on Amazon or eBay for between £10 and £20, but make sure your device supports the technology before you buy. A list of some compatible hardware can be found at bit.ly/slimport336.

If your device doesn't offer SlimPort there's a good chance it will support MHL (Mobile High Definition Link) instead. This works in much the same way and lets you connect your phone or tablet to an HDTV or monitor. You'll need an adaptor, which will set you back between £5 and £10 (look on Amazon or eBay again). Plug the micro USB end into your device and connect the HDMI cable to your TV. You can check to see if your smartphone or tablet is MHL compatible by going to bit.ly/mhl336 and scanning the QR code with a QR reader app.

Alternatively, just browse the list at bit.ly/mhl336. Devices which support the MHL standard include the Samsung Galaxy S II, S III and S4, HTC One, and Sony's Xperia range of smartphones.

Use Google Chromecast
Chromecast (bit.ly/chromecast336) is a small, low-cost dongle that connects to your TV and lets you 'cast' media to the screen via your Android device. You can send videos and stream web content from Google Play, YouTube and Netflix. It doesn’t offer mirroring (it won’t display what’s on your tablet’s screen), although code snippets found in the latest version of Android (4.4) suggest this feature is planned for the future.
Initially available in the US only, Chromecast has recently been officially launched in the UK and you can buy one for just £30 at www.snipea.com/12200. The device offers a growing number of services that includes BBC iPlayer.

**Use CheapCast**
CheapCast ([bit.ly/cheapcast336](http://bit.ly/cheapcast336)) is a free app that aims to emulate the Chromecast dongle, and stream content from an Android device to a big screen. It’s a handy way of watching YouTube videos on your living room TV, or pumping songs from Google Music through your surround sound speakers. There is a catch though. You’ll need two Android devices – one to act as a transmitter, and the other to act as a receiver. The receiving Android device will need to support MHL or HDMI, and you’ll need the relevant cable in order to hook it to your TV. Connect the receiver and install CheapCast on it. Configure it (setup takes seconds) and then download and install the official Chromecast app ([bit.ly/chromecastapp326](http://bit.ly/chromecastapp326)) on the device you’ll be sending content from. The Chromecast app should find your CheapCast device and connect to it as if it were a Chromecast.

While this sounds like a cheap alternative to the Chromecast (even factoring in the price of an MHL adaptor), the app is in beta and can be quite buggy.

**MINI WORKSHOP**  Run apps on the Media Art 7 Ultra set top box

**Step 1**
Connect the device to your TV, then pair the remote. Press the Menu button to access the main screen. Go to Setup and enter the PIN (the default is 0000). The Setup screen will allow you to search for television channels, set the date and time, configure various sound and display options, and connect the set top box to a wireless network.

**Step 2**
Once you’ve set up Wi-Fi, return to the Menu and select the App screen. This will give you access to the Android Market where you can download Adobe Flash Player, Google Play Installer and other apps. You can sideload apps in APK format, open the browser and so on. Once installed, the Play Store will give you access to thousands of apps.

**Step 3**
Before you can download anything from Google Play you’ll need to link an existing Google account (or create a new one) and agree to the terms. When everything is configured, you’ll be able to download apps directly from the store. The Top Free section, which includes Facebook, Skype and Temple Run 2, is a great starting point.
Turn your TV into an Android console by running apps on it

Netflix, as well as popular games such as Angry Birds, Cut the Rope and Candy Crush Saga. We show you how to set up apps on the device in the Mini Workshop on page 103.

To get the most from the device you really need to receive your TV signal via satellite, but the box offers more than enough features to make it worth considering even if you get your TV another way. The small remote offers a track pad controller in the centre of the top side, and a mini QWERTY keyboard (with actual keys) on the reverse. Because it comes with four USB 2.0 slots you can also plug in an external keyboard and mouse, and interact with the on-screen action that way.

The device has 4GB of flash memory, for storing apps and media, as well as 1GB of RAM memory.

Get Android on your TV with a specialist box – this one also receives satellite TV

Use Miracast

Miracast is a peer-to-peer wireless screencasting standard that displays a complete mirror of your tablet’s display on a big screen. To use it you’ll need a Smart TV or Blu-ray player that supports the Miracast protocol for wireless display, and a phone or tablet that’s also compatible. Examples of supported devices include Google’s Nexus 4, Nexus 5, Nexus 7 (2013), and Nexus 10, and the HTC One. You can find a list of all compatible devices at bit.ly/miracast36. See our Mini Workshop, below.

MINI WORKSHOP

Send your tablet’s display to a TV using Miracast

Step 1

The process of setting up Miracast on your TV or Blu-ray player will vary slightly depending on the equipment. You may need to go through the Network, Home Network menus to access the Miracast option. Launch the feature and then get your tablet. You’ll have a limited time to make the connection.

Step 2

To turn the feature on in the Nexus 7, open Settings and tap Display under Device. Look for the Wireless Display option at the bottom of the screen. Tap this and your TV or Blu-ray player should appear (listed as Available) under Paired Displays 1. If it doesn’t, tap ‘Search for Displays’. 2. Select the device to make the connection.

Step 3

Everything on your tablet’s screen should appear mirrored on the TV, including apps, games, photos, streaming videos and movies. You can end the connection at any time.

1 Tapping Options will let you rename the connection for future access, 2 or forget about it. 3
Keep a diary on your Android phone or tablet

Turn your tablet or phone into a portable digital diary using a free app

Smartphones and tablets are ideal for keeping a diary. They are always on hand to jot down your thoughts, they have built-in cameras and microphones to record things you see during your day and you can keep nosy parkers locked out with a password. Now, Android users can install a great free app called Memoires: the Diary (www.snipca.com/10453), which helps you do all these things and more. Here we explain how to compose digital diary entries, how to protect your privacy with encryption and how to export and make backups for safekeeping.

**STEP 1** Memoires provides three main ways to create a new diary entry. Tap the microphone icon 1 to record a voice memo, then the green stop button when you’ve finished recording. Alternatively, tap the camera icon 2 to take a photo, or the speech bubble icon 3 to write a text. In all cases, you can give your diary entry a title and add any further notes, emoticons and tags that you want. Memoires will automatically add your current location, time and weather data to your entry (unless you’ve switched off location services on your device). Tap Save.

**STEP 2** Diaries should be private, so Memoires helpfully lets you encrypt your journal. In the main screen, tap the top-right Settings button then select Preferences. Tap Password, enter your password in the box, then provide a secret question and answer below. Tap the top-right tick button then Continue. Next, tap ‘Privacy settings’. Here you can tick the box next to ‘Lock Memoires on exit’ 1.

**STEP 3** To avoid losing everything in the aftermath of a technical problem, Memoires offers lots of ways to export, sync and back up your data. Tap Settings, Preferences then select ‘Backup options’ and tick all the boxes. Return to the main screen, tap Settings, then Import/Export. Here you can check your sync settings and make a manual backup 1 if necessary. You can sync with Google Drive 2 and copy your diary to the cloud. To make a hard copy of your diary, tap ‘Export as RTF Document’ 3 then transfer the resulting file to your PC to print.
Security & privacy

The more we rely on our smartphones and tablets, the more important it is to keep your data safe. In this chapter we explain how

When you’ve just spent a sizeable amount of cash on a shiny new Android tablet or smartphone and then proceeded to stuff it full of personal information, emails, social networking accounts and more, the last thing you want is for your favourite toy or the data stored on it to fall into the wrong hands or fall foul of some rogue app. The good news is that there are plenty of ways to protect your Android device. And, in this chapter of our guide, we’ll be explaining precisely what you need to do if you want to keep your tablet or phone and the data it holds as safe as possible.

HIGHLIGHTS

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- How secure is Android and what can you do to stay safe? We explain all you need to know
- Improve the security of your Android device with an effective free tool
- How to make sure your Android phone or tablet stays as safe as possible
- We demonstrate two ways to make sure you never lose the data on your tablet or mobile
Protect your privacy and safety

Once you’ve been using your Android device for a while, the chances are you won’t want anyone else getting hold of it. With email, Twitter, Facebook accounts set up, it’s likely to be filled to the brim with personal information that you won’t want anybody else rooting around in, not to mention all the documents, photos and other files you wouldn’t want falling into the wrong hands.

Similarly, we’re often warned that malware is a concern with Android – that so-called ‘rogue’ apps and viruses can damage our devices and steal our data. The good news is that there are plenty of ways to protect your privacy and the keep the data on your Android device safe. In this article – and in the remainder of this chapter – we will be explaining how to do just that.

Lock your device

The first step to securing your device is to put a lock on the front door. The simplest way to achieve this is to set up a PIN code. Once you’ve done this, every time you turn on the phone or tablet you’ll be required to enter a four-digit number. You’ll find all the settings you need in the main Settings menu in the app drawer, under the Security entry. Tap the ‘Screen lock’ entry, which sits at the very top, then tap PIN to set up your code.

If remembering numbers isn’t a strong point, there are other options available under ‘Screen lock’. You can use a password to keep your device secure. You can use a pattern to unlock your phone or tablet, where you draw a shape on a grid of nine dots to gain access. This can be quicker and easier to enter and is no less secure than a PIN or password. And, if you’re really lazy, you can unlock your device using facial recognition (Face Unlock). However, bear in mind that in darkened environments this system won’t work particularly well. For even more protection, head to page 111, where we’ll explain how to lock your device with a special app for added protection.

Encrypt your data

A PIN, password or pattern can prevent the casual thief or opportunist from accessing your data, but if you want to be sure they won’t be able to extract your emails, passwords and other sensitive information if your tablet or handset is lost or stolen, you’ll need to use your Android device’s encryption option. Encryption works by scrambling all the data stored on the tablet, so it’s accessible only from the tablet and by the person (for example, you) who knows the unlock key – be that your PIN or password. Without encryption, any information extracted from the tablet without unlocking it first would be unreadable.

Fortunately, you don’t need to be a security expert to set up encryption. Simply tap the ‘Encrypt phone’ or ‘Encrypt tablet’ option in the Security menu, then follow the instructions. You’ll need the device to be fully charged, however, and plugged into the mains, since the encryption process can take some time.

Avoid rogue apps

Android has, somewhat unfairly, garnered a reputation for being unsafe. In fact, security on Android is much stricter than in Windows. Every app that needs to access files or use a device’s hardware features (such as the phone or Wi-Fi network) has to be given permission by the user. Without these permissions, the app cannot work.

Permissions are wide ranging, and include sensitive tasks such as accessing contacts and emails, determining the device’s location, sending data to websites and much more.

The problem is that although the permissions an app needs are shown during installation, the user does not have to explicitly approve them. Many
users click ‘Install’ with no more than a glance at the permissions.

This means an innocent-looking free app might be able to harvest private information for malicious purposes. Google Play store apps are safe, as they have to be approved, but even simple apps seem to have surprisingly broad permissions. Why does a drawing app for kids need to access the device’s phone number, for example? The problem is much worse in some third-party app stores, with many fake apps that contain spyware and trojans.

Check permissions

So, when you install an app from the Play store, you should always read the list of permissions that appears after the Install button is clicked on the app’s home page. Tap on a permission to see a detailed description, and tap the Show All link to see the list of permissions. If in doubt, don’t install it – there are likely to be plenty of alternative apps.

Many free apps, particularly games, request permission to use Google Play billing, which usually means they allow in-app purchases. This is worth watching out for, especially if you’re installing the app on a child’s device, as it’s often not made clear on the app’s Store page. Ad-supported free apps also need access to personal information so they can deliver targeted ads within the app – again, if you don’t like this idea, don’t install the app.

To check the permissions of any installed app, open Settings and tap Apps. Tap an app and scroll down to see the Permissions list. Permissions cannot be altered, so if an app looks suspicious, get rid of it by tapping the Uninstall button.

To prevent apps being installed from anywhere except the Play store, open the Settings menu and tap Security and scroll down to ‘Device administrators’. If the ‘Unknown sources’ setting has a tick, tap to turn it off – however, bear in mind this also prevents the use of any manufacturer-installed app stores, such as Samsung’s and Sony’s. Put a tick in the option next to ‘Verify apps’ too – this will show you a warning whenever Android detects that a potentially harmful app is being installed.

Take precautions

Some security and privacy-related services can be configured from the Settings screen, overriding any app permissions. The Location and Security sections allows the user to configure location services that use Wi-Fi or GPS satellites, and also whether to allow Google to use your location for web searches (for showing shops or businesses). Tap the respective service to toggle it on or off.

The latest versions of Android allows multiple users on one device. This is great for those who share a tablet, as it allows different security and
privacy settings for each account. To see how this works, read the workshop on page 129.

**Protect your privacy**
Privacy can be a big worry on mobile devices. All Android devices require a Google Account to download apps from the Play Store, and this account can be used to back up Wi-Fi passwords, application data, bookmarks and other settings. This is convenient, but those who prefer not to send this data can turn it off in the ‘Backup & reset’ section of Settings. Tap the ‘Back up my data’ setting to toggle it on or off. However, disabling this setting means that when re-installing an app, it won’t remember any previous settings. We thoroughly recommend backing up your device too – see our workshop on page 114 to find out how.

Email and social networking accounts can also sync private data, such as contact lists, web history and calendars, between devices, and the settings for these are found in the ‘Accounts & sync’ section of the Settings menu. Tap an account to customise which items are synchronised.

**Stay safe on wireless connections**
While using 3G and 4G mobile data connections is relatively safe, using public Wi-Fi hotspots can allow eavesdroppers to monitor your activity if precautions are not taken. Only use Wi-Fi connections that you are sure are genuine, and preferably secured with a password.

We recommend you don’t use online banking or shopping when connected to a public Wi-Fi hotspot, but if it is unavoidable use a VPN app, such as the free Hotspot Shield (www.shield.com/393) to keep your data secure.

Another security weakness is Bluetooth. If a device is made discoverable, anyone can access it. To fix this, turn Bluetooth off if it is not needed, or hide the device. Bluetooth settings are found in the ‘Wireless & Networks’ section of Settings. Tap Bluetooth to toggle it on or off, and to make the device invisible, tap Bluetooth settings, then tap your device to make sure it’s set to ‘Only visible to paired devices’.

Is your home Wi-Fi secured? If so, are you using WPA2 encryption? If not, then you need to access your router’s configuration utility and change the security settings accordingly. Check the instructions that came with your router to find out how.

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**Do I need an anti-virus app?**
A few years ago, there weren’t many mobile viruses in the wild, and those that existed were fairly innocuous. This is no longer the case, especially on the Android platform. The Obad trojan, which appeared last summer, for example, can send SMS messages to premium-rate phone numbers, download further malware, and even replicate itself on other devices via Bluetooth. It’s easy to pick up infections like these, too, especially via infected apps on fake versions of the Play store, which spring up from time to time. It’s easy to land on one of these if you do a Google search for an obscure app; the fake Play stores often look just like the real thing at first glance. To stay safe, always check the URL, or perform your search via the genuine Play store.

Another way to boost your protection against this type of threat is to install an anti-virus app. Like most apps, they come in free and paid-for versions, although the detection quality doesn’t seem to vary much between them – most of the main security products detect the most common Android threats. The big differences between the products tend to involve ease of use, and the variety of extended security features on offer. One thing you’ll discover with all these Android security apps is that they can’t automatically uninstall apps infected with malware; you’ll need to do this manually. See the box on page 109 for the best free and pay-for anti-virus tools.
Lock your Android phone or tablet

Improve the safety of your Android device with this effective free security tool.

Although all Android devices let you set up a basic screen lock, it is very limited in terms of the protection it offers. Lockdown Pro (bit.ly/lockdown344), on the other hand, allows you to specify which apps to protect and includes sophisticated tools to ensure that others can't access your private information. Below we're going to show you how to use this essential free app – this workshop should take about 10 minutes to complete.

**STEP 1**
Download and install Lockdown Pro from the Google Play store. Launch it and choose Classic password mode and set up a security question. On the app home screen is a list of all apps installed on your phone. Tap the red button next to any app to password-protect it.

**STEP 2**
Tap Lockdown Pro and in Settings, turn ‘Device administrator’ on to ensure that the app cannot be uninstalled without your permission. Click ‘Hide “Lockdown Pro” icon’ to go one step further and stop anyone finding the app. This option requires you to call **#123** to access the app.

**STEP 3**
From the main menu select Password Manager to change your password settings. Here you can change your password type to Pattern 1 or Calculator. You can also turn on both the ‘Random keyboard’ and ‘Time pin’ functions, which stop anyone learning your pin by looking over your shoulder.

**STEP 4**
In Lock Options, you can choose the time limit before Lockdown Pro will re-lock your apps. Turn on ‘One tap to lock’ to be prompted to protect any new apps that you download. Under the Location and Wifi subheadings you can lock/unlock apps based on your location or network.

**STEP 5**
Select Fake Cover from the main menu to use one of Lockdown Pro’s best features. Fake Cover displays an error message when you attempt to access one of your locked apps, so intruders will not realise that it has been password protected. Long-press OK to open the pin-entry screen.

**STEP 6**
From the main screen select the wand icon to change the app's theme. Here there are options to change the appearance of the lockscreen including transparent themes that retain the overall appearance of your phone. Tap Get Theme to browse a wider range of free themes in the Play Store.

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Scan and secure your Android with Malwarebytes

Use the Android version of Malwarebytes Anti-Malware to make sure your phone or tablet stays as safe as possible.

Android is the new favourite target for malware creators, according to security experts, so we're very happy see that one of the most effective security tools around, Malwarebytes Anti-Malware (www.malwarebytes.org), has made its way from the PC and onto Android devices. Malwarebytes Anti-Malware is available from the Google Play store (bit.ly/bytes32s). You'll need a device running Android 2.3 or higher to install it. The app's basic function is to scan your phone and memory card for malware, Trojans and spyware, which you can do manually or on a schedule. It also has mobile-specific tools that highlight any key flaws in your security settings, it scans your installed apps for privacy-violating permissions, and you can link the app to your Android Device Manager to help you find your device if it's lost or stolen.

**STEP 1**
Download and install Malwarebytes Anti-Malware. The first time you open the app, you're prompted to enable real-time protection. 1. This scans apps and files on your phone or SD card for malware every time you open them. Tap 'Turn on' to enable, 2. or Cancel to skip. 3.

**STEP 2**
Real-time protection offers the highest level of security but costs battery life and memory. To enable or disable it, tap the dots, 1. Tap Settings, 2. and tap to un-tick the Real-Time Protection check box. 3. Tap Scheduled Scans 4. to set up a regular schedule.

**STEP 3**
Scheduled Scans and Scan After Update are enabled by default. 1. Tap Scan Frequency to change the schedule, currently set to Daily. 2. The availability of other options, such as Time, depends on your schedule. Tap any tick-box to toggle it on or off.

**STEP 4**
Tap back to the main screen and tap Scan Now 1. to trigger a scan manually. If any malware is found, tap Delete to remove it safely. If the scan identifies an item that you want to keep, tap Skip or 'Add to Whitelist'. If no malware is found, tap OK. Tap App Manager. 2.
**STEP 5** Application Manager lets you monitor your installed apps. The default tab shows which apps are currently running. Tap one to view usage details such as CPU and memory. Tap ‘Force close’ to close the app and tap System Info for more options.

**STEP 6** Tap ‘Clear data’ to delete the app’s data, or Uninstall to delete the app and its data. Tap Disable to prevent the app from running. Tap Move if available, to move it to your memory card. Drag the screen up to view cache, defaults and permissions info.

**STEP 7** Tap back to Application Manager and tap Installed to see all your downloaded apps. Tap Whitelist to see and edit a list of any apps you’ve excluded from Malwarebytes’ scans. Tap the dots and History to see your recent scans. Tap a scan for details.

**STEP 8** Tap Privacy Manager on the main screen, and tap Scan. Malwarebytes looks for apps that can access your data, and divides them into categories such as Monitor Calls and Read Personal Info. Tap a category for details and tap an app to see its permissions.

**STEP 9** Tap Security Audit to view optional audit to potential security problems. Green ticks indicate that you’ve applied the remedy. Tap red crosses that you haven’t. Tap a red cross to visit your settings. To open Android Device Manager, tap ‘Find my phone’.

**STEP 10** Sign into Google if prompted and tap Accept to let Android Device Manager locate your device. To update its current location, tap the compass. To edit its name, tap the pencil. To choose what happens if your phone is lost, tap Ring or ‘Setup Lock & Erase’.
Back up everything on your Android device

We demonstrate two different ways to make sure you never lose the data on your tablet or mobile handset.

How often do you back up your phone or tablet? If the answer is 'never' or 'rarely', then all those text messages, photos, contacts, settings and more that you carry around in your pocket could easily get lost forever. In this workshop we're going to demonstrate two different ways to back up your Android device. Avast Mobile Backup (bit.ly/avast328) lets you save your Android's data regularly to secure cloud-based servers. EaseUS Todo Backup Free (bit.ly/easeus346) lets you back up to your PC wirelessly.

**Expert tip**
To restore backups in Avast, tap Browse Backup on the dashboard to view your backup files. Tap 'Restore all' to restore all the files to your device. To view or restore specific files, tap a file type, such as Images, and either tap 'Restore all' or select items. You can restore data to a new Android device this way after installing the app on the new phone or tablet and signing in.

**STEP 1**
Download Avast Mobile Backup. Tap 'Set up avast account' and 'Sign in with email'. If you already have an Avast account, your email will appear. Tap 'Sign in'. Tap 'Set up Google Drive' and create or sign into your Google Drive account. Tap OK. You can create a Google Drive account later if you want.

**STEP 2**
You're prompted to choose settings such as type and size of files to back up, but you can edit these later from the app's home screen. Tap Run Backup to run an immediate backup, and tap 'cancel job' to cancel. Check your schedule under Backup Status. To change the items to include in a backup, tap Backup Items.

**STEP 3**
Tap the tick boxes to enable or disable items such as Contacts and Short Messages (SMS). Tap Images to enable 'All images' or to select specific images to back up. Audio Files, Videos and Apps can only be backed up in the premium version. Tap the Avast icon to return to dashboard or the sliders icon to open Settings.

**STEP 4**
Tap Backup Restrictions to enable options such as backup over Wi-Fi only or to set up PIN access. Tap Backup Schedule and tap a day to remove it from the schedule. Tap the displayed time to change it. Tap 'Reset to Default' to run a backup once every day. Tap the Avast icon to return to Settings, and again to return to the dashboard.
On the dashboard, tap Backup Events to choose backup triggers in addition to your schedule. Tap any trigger to enable it. For example, to run a call log backup whenever you make or receive a call, tap Incoming/Outgoing Calls. Once you've run a backup, tap the dashboard's icon to view an Error Log of items that failed to back up.

Now let's try EaseUS. Go to bit.ly/easeus346 and fill in the form to receive a download link for EaseUS Todo Backup Free. Click the link in the email and install and run the program. After it's launched, click OK to confirm your free licence, then click 'Android backup' on the home screen.

Visit bit.lyqr346 on your PC and scan the QR code with your phone to download the APK file that lets you back up your Android wirelessly. If you receive a warning that it could harm your device, tap OK. Make sure you can install files from 'Unknown sources' by accessing Security in Settings, and then open the file.

After opening the file, tap Install. Accept and then Open to launch the app. Make sure your PC and Android are connected to the same wireless network and click Refresh on the PC. Your device's name will appear.

Click the device name to see a number of options about the type of backup you want to perform. By default, Contacts, Messages and Call Logs are selected. Tick Documents, Music, Photos and Videos to carry out a comprehensive backup.

If you want, you can rename your back-up in the 'Plan name' box. Use the Description box to include any further information. Files will automatically be saved to C:\My Backups, unless you click the folder icon to choose a new file destination. Click Proceed. A bar shows the progress of your back up.
Advanced tips & tricks

One of the great things about Android is that you can tweak and customise it to your heart’s content. We explain how...

or all its benefits, the really annoying aspect of iOS is that it’s such a closed platform. Basically, Apple decides how things are going to be and, beyond changing your home screen’s background or re-arranging your apps, there’s very little you can do to modify it.

Not so with Android. There are loads of ways to personalise, perk up and generally play with the way your phone or tablet looks and works – you can even make it look like iOS, if you really want to. This chapter is all about exploring Android’s customisation options and unlocking the hidden features you didn’t even realise were there.

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Customise your Android device

Learn the accessibility and customisation tricks that make Android the most versatile out of all the mobile operating systems.

Android is sometimes unfairly labelled as less intuitive than Apple's mobile operating system, iOS, but the one criticism that could never be levelled against Google's effort is lack of options. The fact is, Android owners have the luxury of being able to tweak the way their devices work in infinitely more ways than those packing Apple gadgets.

From simple changes like being able to hide unwanted Google apps from the home screen to changing the way the operating system looks and feels, Android has always been ahead of the competition – and never more so than with the latest editions, 4.4 (KitKat) and 4.3 (Jelly Bean).

Similarly, the various versions of Android are packed with a wide selection of accessibility tools design on to make using smartphones and tablets easier for those with sight, hearing or motor impairments – but few people seem aware of these.

But we’re going to right these various injustices right here, right now, as we reveal a whole bunch of brilliant tricks and tips for making your Android device work just the way you want.

Find the Settings screen
When it comes to customising an Android device the most obvious place to start is the Settings screen. In many cases, there will be a clearly labelled Settings icon on the home screen. However, this label won’t always be displayed, such as when the Settings icon is placed on the dock bar at the bottom of the screen. The icon’s appearance has evolved across different versions of Android. In the latest editions, for instance, it is a cog, but in some earlier editions the icon looks like square bearing three small slider controls or, in some cases, a blue-ringed dial.

From here on we’ll refer to the Settings page simply as Settings, but understand that the precise look, feel and layout of the screen will vary from Android version to Android version and from device manufacturer to device manufacturer. Moreover, not all options that we mention will be available on all Android devices. While we’ll do our best to point out significant differences, it is simply impossible to offer advice that covers every possible permutation.

The most important customisations that you can make to an Android device are to enable various security settings. These options are on the Security screen, from Settings. You’ll find an in-depth explanation of what’s on offer here by reading the article on page 108 but, at the very least, enable the Screen lock option to ensure that your device protects itself when switched off.

Sound and display
Every Android device may thrill or frustrate you with variety of sounds, from tap-dripping keyboard clicks to uplifting or irritating ringtones when a
The sounds your device makes can be customised in a number of different ways. Fine-tune the volume for different activities, change ringtones and more.

You can set your own custom MP3 ringtone by browsing your device.

Altering your device's display settings can make it easier to see.

phone call arrives. It is simple to change most of these sounds, but the precise process depends on the Android version, device type and manufacturer.

To see what options are available on your device, tap Settings followed by Sound. Most of the options here are self-explanatory, and are enabled or disabled by tapping the appropriate tick-box. On smartphones, for example, you'll see a 'Phone ringtone' option. Here you can either select from a list of predefined ringtones or supply one of your own – this can be a music track stored on the device, for example.

This works differently depending on your device, your Android version and the other apps you may have installed. In KitKat, for example, if you have a file manager app (such as ES File Explorer – see page 76) installed, tapping on the 'Phone ringtone' setting prompts you to choose an app to proceed. Opt for the default Media Storage to access the list of ringtones on your device, or tap the file manager app to browse your device for an MP3 file. If you're using an Android tablet, on the other hand, the ringtone option won't be available at all.

For fine-grain control over the sounds emitted by your device, tap the Volumes option to access a selection of slider controls – some Android devices allow separate control over alarms, notifications and other sounds, for example.

Another important customisation option in Settings is Display. Tap this to view the ways in which your device's screen can be tweaked. For example, if you find the displayed text uncomfortable to read then tap Font size and choose a different size (though this option isn't available on many early smartphones).

Similarly, if you find that your device's display is far too keen to flip its orientation as you move it around, you could consider unchecking the 'Auto-rotate screen' option here – if it's displayed. On some devices, the screen-orientation option is also found in the Quick Settings dialogue box – tap or

Even more accessibility
As ever, some Android devices are better equipped than others when it comes to accessibility. With Android 4.2, for example, Google introduced magnification gestures. Enabled in the Accessibility page within Settings, these allow users to triple-tap at any time, and in any app, to zoom in to the screen. Once zoomed in, just drag two fingers across the display to move around, or pinch to change the zoom level. Another option is Accessibility Shortcut. Switch this on and you can enable or disable all accessibility in one of two ways: either hold down the power button and wait for an audio signal or vibration, or hold two fingers on the display until you hear an audio cue. Finally, don't overlook other ways to improve accessibility. For example, when it's cold outside, a pair of touchscreen gloves will keep your hands warm while still allowing you to control your device. Expect to pay less than £10 (see this GreatShield pair, www.snipca.com/42291).
drag down from the clock in the topmost status bar to see this.

Add widgets
One of Android’s best features is the ability to display widgets alongside app icons on its home screen, or screens. These are effectively mini apps that are able to display up-to-date information or provide quick access to certain settings. The Facebook app for Android, for example, comes with two widgets – one that displays the latest item from your newsfeed, and an icons bar for creating posts, uploading photos or for checking in with your location.

Adding or removing widgets is straightforward though, as ever, the precise method depends on the Android version and device. The most universal method is to long-tap an empty space on your device’s desktop and then select the Widgets options when it appears. On some devices, you’ll need to tap the App Drawer icon (it’s a circle with six dots), then tap Widgets. In all cases, swipe to browse available widgets, then tap and hold a widget you want to use before dragging and dropping it into place on the desired home screen. To remove a widget, just tap and hold it then drag it to the Remove label or the dustbin icon that appears.

Advanced customisations
Adventurous types might want to toy with some trickier customisations, because in many cases it is possible to change the way individual parts of the Android operating system look and feel.

For example, if the default Android keyboard annoys you then it may be possible to replace it by downloading and installing an app. A popular choice here is Swiftkey, thanks to its accurate prediction system – download the free version from the Google Play Store, at www.snipca.com/8324 (it works with most versions of Android, from 2.1 onwards). For more about using alternative keyboards, see page 137.

This advice holds true for many other aspects of Android, so if something about the operating system annoys you, search in the Google Play

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**MINI WORKSHOP** Navigate Android with Explore by Touch

**Step 1**
Open Settings and choose Accessibility. Now tap TalkBack and then tap to flip the slider switch to On. Your Android device will begin talking to you. Listen to its instructions – Explore by Touch has been enabled.

**Step 2**
Now move your finger slowly across the display, keeping your finger on the screen at all times. A yellow marker will be placed around the target item, and the Android device will read aloud its label or contents.

**Step 3**
To activate a selected item, double-tap it. To disable TalkBack and Explore by Touch, return to Accessibility, select and double-tap TalkBack, then double-tap the slider to switch it to the Off position and, finally, double-tap OK.
store for a suitable replacement. Alternatively – or as well – it is possible in many cases to throw out the default Android 'experience' and put in place a different user interface. Android's stock look and feel is provided by an inconspicuous app called Launcher. But like most everything else with Android, Launcher can be usurped (at least in some cases – read the box on page 118 for more on this).

Replacing Launcher really isn't for novices, because the results can be disorienting, and therefore confusing, but if you are a fan of tweaking, it is a fun activity to try. There are many alternative launchers available in the Google Play Store, each with its own pros and cons. Simply search for 'launcher' in the store and then tap Results to see the full list of them.

One of the most popular is Go Launcher (www.snipca.com/12250), though all are installed (and removed) in much the same way so it doesn't much matter which you try. Once installed, hit the device's Home button and a dialogue box will offer a choice of launchers – Launcher (that's Android's default) or, in this example, Go Launcher Ex. Tap Go Launcher Ex and then choose whether you'd like to suppress this dialogue box (by tapping Always) or have it pop up next time you press Home (tap Just once instead). For now, we'd suggest choosing 'Just once'.

The whole point of alternative launchers is that they're individual, so we can't tell you exactly what to expect but, with Go Launcher Ex, for example, default icons are replaced and the display density is improved (so more but smaller icons are displayed in the same space). As well, Go Launcher Ex allows easier management of multiple home screens. Try pinching your fingers together on a home screen to see all screens tiled; and rearrange screens by holding then dragging and dropping. If you inadvertently or intentionally selected the Always option when trying a new launcher, it is still possible to revert to Android's default interface. To do this, launch Settings then tap Apps (or Applications on some older devices) followed by the relevant launcher app's entry, then tap the Clear defaults button.

**Improve accessibility**

As we mentioned in this article's introduction, another set of useful customisations are to be found in Android's accessibility settings. These are generally intended as aids for those with varying physical impairments, though some options have wider appeal.

Accessibility options have been part of Android since the earliest versions, but they matured nicely with version 4.0 (Ice Cream Sandwich) and beyond. To see what's available on your device, tap Settings then Accessibility.

One of the most useful settings is TalkBack and its Explore by Touch feature. Intended for those with visual impairments, this essentially enables you to drag your finger around the screen and have Android announce what's under your digit. To learn more, see the mini-workshop opposite. It works best in Android versions 4.0 and above, but it also exists in earlier versions. If TalkBack isn't installed on your device, then get it from the Google Play Store at www.snipca.com/8327.

Another useful option that you may find in the Accessibility page is 'Touch & hold delay'. Tap it and choose the Short, Medium or Long radio button to set the delay required for touch-and-hold actions – for example, when dragging and dropping items about the home screen.

For more accessibility on how to improve Android's accessibility, see the box on page 118.

As is probably obvious by now, Android is as customisable as it is diverse. While the platform's diversity can cause confusion when switching devices and certainly creates headaches for the likes of us when trying to write coherent and consistent instructions, the customisability of the operating system more than makes up for these irritations. If there's something about your Android phone or tablet that you don't like, then you now know that a fix or alternative solution can usually be found quickly and easily that will suit your needs.
Get the best of iOS 7 on Android

There’s no need to abandon your Android device if you’re tempted by Apple’s operating system. We reveal ways to make Android look and work like an iPhone or iPad.

Maybe you gaze in envy at your friends’ iPhones and wish you had one, or perhaps you’ve left Apple’s devices behind and moved to Android but miss some of the ways your old iPhone or iPad worked. Whatever the reason, you’ll be pleased to hear that Apple and Android don’t need to be mutually exclusive. There are some clever ways to get many of the features and interface elements found in iOS on your current device without having to pay the high premiums associated with switching to Apple’s hardware. In this feature we will demonstrate how to do just that using free apps to give your Android device an iOS 7 makeover.

Get the iOS 7 look
iOS 7’s flat new pastel-coloured world isn’t to everyone’s taste. When YouTube user Derek Colling installed the new iOS on his iPad, his young son Jack was heartbroken (bit.ly/ijack330).

But if you like the new look, which Apple describes as “eschewing the skeuomorphic panache of earlier iterations”, or if you’re just curious to know what on Earth that means, Esper Launcher 7 (www.snipca.com/12203) will give your Android a full iOS 7 makeover for free.

The effect is disconcerting. It really does look like Apple has invaded your Android device. Your existing app icons are iOS 7-ified and you can store them in iOS-style folders. Everything still functions as before, including your widgets and shortcuts, so the app effectively merges iOS 7’s looks with Android’s brain.

Warning: if you know any four-year-old boys named Jack and they love your Android, Espier could make them very upset indeed.

Get the parallax effect
Some loved it, some hated it, others were too nauseous to care. iOS 7 adds a little 3D experience that makes home screen icons float when you move the phone around, and this so-called ‘parallax effect’ has been making some users seasick on dry land. For more on the science of this phenomenon, see bit.ly/sick330.

If you’re up to the challenge, iOS 7 Lockscreen Parallax HD (bit.ly/parallax330) brings the tilts, zooms and rolls of iOS 7’s parallax effect to your Android, along with an iOS 7-style lock screen and Control Center toolbar. iOS 7 Live Wallpaper 3D (bit.ly/wallpaper330) isn’t as slick but has some very pretty iOS 7 backgrounds with optional parallax animation.
Get a passcode lock screen

Once you've installed Espier's Launcher, there's a whole family of plug-in apps that you can use to mimic other iOS 7 features. For example, Espier Screen Locker 7 (www.snipca.com/12204) lets you lock your phone with an iOS 7-style slider and optional passcode PIN. Once you've disabled your system lock and set up the Espier version, your lock screen is indistinguishable from an iOS 7 lock screen except that it's not encased in an iPhone. You can then customise the name of your phone, change the 'Slide to unlock' text to something else and, for an in-app purchase, customise the sound that your phone makes when you lock, unlock or charge it.

Get the Control Centre

One of the most coveted features of iOS 7 is the Control Centre, which appears when you swipe up from the bottom of the screen to give you instant access to the controls you use most often: Wi-Fi, screen orientation, music player and so on.

iOS Control Center-QuickToggle (www.snipca.com/12206) adds this widget to Android, along with the option to open it anywhere on your screen. The tool outshines its Apple precedent by letting you choose from a huge range of controls to include.

Espier has also created a Control Centre for Android (bit.ly/escontrol330). Like the Screen Locker it's a plug-in that will only work if you've got Espier Launcher installed. You can also choose whether to make the Control Centre accessible from inside other apps.

Get iPhone-style notification badges

Espier Notifications 7 (www.snipca.com/12205) is another free plug-in for the Espier Launcher. This one lets you see all your app notifications in iOS-style ways, including red notification badges (the dots you see on iOS app icons) or, if you've installed Espier Screen Locker 7, banners overlaid on your lock screen. It's quite useful for merging multiple notifications from individual apps, but other than that it's really just a slightly tidier way of getting your familiar Android notifications.

Get AirDrop, but better

iOS has always had its strengths, and file transfer has never been one of them. For some unfathomable reason, getting files onto and off an iPhone or iPad – or even an iPod – has always been a right pain.

So the new AirDrop tool seems revolutionary, but it's not. It lets you share files wirelessly between your phone and your PC and with other users, but so does the superb free Android app ES File Explorer (bit.ly/filex330). AirDrop can transfer between devices that aren't on the same Wi-Fi network, but that doesn't seem revolutionary if you're used to Dropbox (bit.ly/drop330).

If you have a Samsung Galaxy S3 or later, the built-in S Beam tool sends files to devices near and far (bit.ly/sbeam330). And AirDrop only lets you send files to another user with AirDrop – for which you need an iCloud account and an iPhone 5 or above.

So it's nothing to get too envious about, but Android developers have more than matched it anyway. AirDroid (bit.ly/air330) lets you take complete (and secure) control of your phone or tablet via your Desktop browser. It lets you send and receive text messages from your PC, locate and lock your phone or tablet when it's lost, wipe its data remotely.

Oh, and it's pretty good at transferring files without a cable. It was voted App of the Year by Android Police (www.androidpolice.com), and its user reviews are the stuff of app developers' dreams. Our favourite: "It's like WD-40 but in a software version."
Set up automatic tasks

Make your Android device even more intelligent by getting it to carry out specific tasks automatically.

Unlike other Android automation apps (such as Tasker and Automagic), Agent is a free app that focuses on just five settings (called ‘agents’) and does them well. The app saves battery life, silences your phone during meetings, remembers where you’ve parked your car, auto-responds when you’re driving and allows only urgent calls through when you don’t want to be disturbed. It’s also one of the easiest Android automation app to set up and customise. Agent can be downloaded from the Google Play store at www.snipca.com/11249. You will need Android version 4.0 or above for Agent to work. This workshop shouldn’t take any longer than 20 minutes to complete.

**STEP 1**
Launch the app, then tap Let’s Get Started. All five agents will be enabled by default.

Tap OK. Tap Battery in the main screen and swipe right to access the Configure section. Set the trigger percent to 20 by moving the slider. This will activate the Battery agent automatically when your phone’s battery level falls below 20 per cent. Tap More Settings. Ensure ‘Disable when charging’ is ticked to disable Agent when your device is charging. Tick ‘Turn off Bluetooth’ and ‘Turn off Wi-Fi’ to dim the screen brightness level to 10 to prolong battery life. Swiping right from the Configure section (in any of your agents) will display an activity log telling you when that agent was last activated.

**STEP 2**
Return to the home screen to see all your agents. Tap the Sleep agent and swipe right to go to the Configure section. Tap the times beside ‘Start time’ and ‘End time’ and adjust the sliders to establish a period of time each day in which you don’t want to be disturbed by your phone, then tap Set. You can create exceptions to allow certain people to call you during these set times. To do this, tap No One beside ‘Who can wake me’ to bring up a list of all your contacts. Tap the ‘Search contacts’ box to bring up your keyboard, then type a name to search for a particular contact. You can also select contacts by tapping them individually.

**STEP 3**
Next, tap More Settings. Tick the box beside ‘Send text to verify urgency’. This feature automatically sends a text to anyone who calls you overnight advising them to text ‘urgent’ if the call is important. If they do this, your phone will ring. You can customise this message if you want by tapping it and editing the text. Tick ‘Allow repeat calls through’ if you want your phone to ring when you get a call from the same number more than once. You can decide if your phone remains silent or vibrates when you get notifications. Scroll to the bottom of the screen and tap the days on which you want these settings to apply.
STEP 4 The Parking agent pins your car’s location on a map so that you know exactly where you’ve parked. To do this, your car will need Bluetooth technology and you’ll need to pair your device to it. To turn your device’s Bluetooth on, swipe down from the top of your screen, tap the icon in the top-right corner, then the Bluetooth option. Navigate to the Configure section of the Parking agent. Tap Unspecified beside ‘Bluetooth connection’, select your car’s Bluetooth from the Bluetooth connections list, then tap Continue. The app records the last position of your parked car by placing a pin on a map. Tap the (+) and (−) signs in the Parking agent to zoom in and out of your car’s precise location.

STEP 5 The Meeting agent silences your phone to coincide with any appointments or events recorded in your calendar apps. Tap the Meeting agent in the main screen. By default all your calendars are selected, but you can deselect any by unlocking them. Tap More Settings to customise how this agent works. You may sometimes have events outside office hours during which you want to accept incoming calls. Set the Start and End times during which you want Agent to block calls. The Meeting agent will only bar calls during events between those hours, rather than all day. Tick ‘Skip events I don’t accept’. This will only enable the Meeting agent if you accept a meeting request in your calendar.

STEP 6 Scroll down and select the days you want the Meeting agent to silence your phone by tapping them. Select whether you want your phone to be silent or to vibrate when you get a notification during a meeting. For times when you’re expecting an urgent call, select ‘Some calls can get through’, tap No One, then select the people who can contact you. Whenever you receive a call from those you select, your phone will ring. You can do the same for texts by ticking ‘Some texts can get through’. If you want to send an automatic text to the caller, tap ‘Send text to verify urgency’ and customise the default text message below. If the caller then texts you back with the word “urgent”, your phone will ring.

STEP 7 Tap Drive to set up the Drive agent. This agent works by detecting the motion sensors in your phone, so you don’t need to connect it to Bluetooth. Next, tap More Settings and select whether you want your notifications on silent or vibrate. When you’re driving, tick ‘Read text messages aloud’ if you want Agent to read your texts to you as they arrive. You can autoreply to calls and messages with a customised text message or select which specific contacts to respond to by tapping My Contacts. Tick the relevant option, then create your own automated text message in the ‘Auto response’ text box. This will be sent to anyone trying to contact you when you’re driving.
Uncover amazing Android secrets

We reveal some of the brilliant hidden features that can be found by digging a little deeper into your device.

If you've picked up an Android-based phone or tablet, then you should be happily surfing the web, downloading and running apps and surfing the web using the built-in browser. You might have also discovered some of the great tools that come built into the device, or experimented with using the camera or Google Maps – it's all impressively easy to use. Beneath the surface, though, there are many ways to get a little bit more from your device, or to make it quicker and easier to use. In this section we have picked 10 of our favourite Android tricks, explaining how you can take advantage of them on your device. Note that some of the tips require the latest version of Android (4.4 KitKat), but most will work on earlier versions too. See page 14 for a comparison of the different versions of the operating system.

TIP 1
See all your Android notifications
How often have you swiped through all your notifications without reading them only to regret doing that later? If you're using a device running the latest version of Android (KitKat - 4.4 and higher), you can easily see all your old notifications. To do this, go to your Android home screen, long-press any blank space and tap Widgets. Go to the Settings shortcut (1x1) widget, long-press it and drag it to your home screen. In the Settings shortcut screen, select Notifications to convert this into your Notifications widget. Tap this and you'll see a list of your last 50 notifications. This will include weather updates, Wi-Fi networks you've connected to, Google searches you've performed and all your app updates.

TIP 2
Customise your Google Play settings
You can customise the Google Play store on your device so that it only displays apps appropriate for certain audiences (children, teens, etc.), and prompts you for your password every time you install an app (to prevent others from doing so). Tap Play Store, tap the menu button (three lines in the top-left), then tap Settings. Tap 'Content filtering' to see five filter categories as shown. Tap the 'More about content filtering' link to see what each one means. Tap Back, tick the filters you want to activate and then tap OK. Finally, tap 'Require password for purchases' and select 'For all purchases through Google Play on this device'. Enter your Google password and tap OK.
**Android / Workshop**

**TIP 3** Get handwriting and voice recognition on any device

Some Android devices have built-in handwriting recognition that turns your scribbles into text. But the latest update to Evernote lets you hand-write words within your notes on any tablet or phone. Download it from [www.snipca.com/12016](http://www.snipca.com/12016), open the app, tap ‘New note’ at the bottom, tap the ‘+’ dropdown menu at the top and select Handwriting. Tap the pen dropdown menu at the top and select a colour and pen size. It obviously works better if you have a stylus, but you can also use your finger. Write whatever you want inside the grid, tapping the Eraser to get rid of any errors. Now tap the top-left Back button to return to your note, tap the ‘+’ dropdown menu again, tap ‘See all’ and then Speech-to-Text. Speak into your device and whatever you say will be instantly transcribed.

**TIP 4** Customise your messaging options

The Android Messaging app displays chats by you and the recipient in the form of chat bubbles which are in certain colours and a black background by default. To change the colour of your chat bubbles, open the Messaging app, tap the Menu icon, Settings, scroll down and then tap ‘Bubble style’. The bubble on the top right is your message, while the one on the top left is the one from the receiver. To change the colour of the chat bubbles, swipe the options below, tap one to select it and tap Save on the top when you’re done. To change your display background, tap the Back button and then tap ‘Background style’. Tap the first option, Image and select an image from your Gallery to use it as your Messages background. Alternatively, you can swipe to the right and select other messaging backgrounds by tapping them. Tap Save at the top for your new background to take effect.

**TIP 5** Set a location-based reminder

Google Keep ([www.snipca.com/11766](http://www.snipca.com/11766)) lets you set location-based reminders, so that you don’t forget to send out that birthday email the next time you’re at home, for example. To set a reminder in Google Keep, open the app and tap the note icon in the top left. Give your note a title and write it down below. Tap the palette icon in the top and then tap a colour you want to assign to your note. Now tap the ‘Remind me’ option, select ‘Location reminder’, type in an address or postcode in the search bar and tap the right option from the autosuggest options. The next time you’re around that location, you’ll see your reminder as a notification.

**TIP 6** Read News-stand articles offline

Play Newsstand ([www.snipca.com/11703](http://www.snipca.com/11703)) is a free built-in app that lets you read mobile-friendly versions of websites and save articles to read later when you don’t have a 3G/4G or Wi-Fi connection. Open the app, tap the three lines in the top left and then My Library. Tap Add More, then tap a news category (for example, Science and Technology), scroll down and tap the + signs next to the sections in that category (The Guardian, The Telegraph, Sky News, for instance) to add them to your reading list. Stories will be automatically updated from the sections you’ve selected. Tap an article to read it and then tap the + Bookmarks sign in the top right to save it offline. Now, when you’re in an area with no network coverage or Wi-Fi, open the app, tap the three lines in the top left, then tap Bookmarks to read the articles you’ve saved to read offline.
Get quick directions when you want to go home

Google Maps lets you add your own address to its app and then quickly generate directions home. This is much faster than typing your address or postcode into the app every time.

To do this, open Google Maps for Android (www.snipca.com/11661), tap the app’s Menu button, Settings, ‘Edit home or work’, then tap ‘Enter home address’. Enter your address or your postcode. As you type, you’ll see a list of address options below. Tap the correct option to set it as your home address. Now, whenever you want to find directions home using Google Maps, tap the Direction icon (blue up arrow), then ‘Choose destination’ box and type home. As you start typing, you’ll see your address under the heading Home as the first entry in the list of suggestions (see screenshot). Tap it to generate directions to your address.

Phone your family faster using Google Now

Google Now has added the option to phone and text family members by saying how they are related to you. For example, you can now say “call my wife” or “send a text to my nephew” to perform those actions. Previously you could only call and text people by saying their full name. Open Google Now on your phone by tapping the blue Google icon (the ‘g’) then tap the microphone icon and start speaking. Say “call my wife”, or something similar. Google will ask you whom you want to call or text. Say the contact’s name as he/she is written in your Contacts app or tap ‘Pick contact’ and navigate to that contact. Google will call or text the contact for you. The next time you repeat the command, Google will remember your option and communicate with the person without asking you who it is.

Create a portable Wi-Fi hotspot

Here’s a tip for those with a 3G or 4G tablet or phone. Did you know that you can share its internet connection with other devices by setting up a portable Wi-Fi hotspot? This will allow a non-3G or 4G-enabled device to piggy-back on your phone’s mobile data connection and get online when other Wi-Fi networks aren’t available. The only drawback with this technique is that it can quickly chomp through your mobile internet allowance, so we advise using it with care. But it can be an incredibly handy way to check your emails or browse the web when you’re out and about. Open the main Settings app, select ‘Wireless & Networks’, then tap More and choose ‘Tethering & portable hotspot’. Tap ‘Set up Wi-Fi hotspot’ to add a password before tapping ‘Portable Wi-Fi hotspot’ to turn it on. The Bluetooth tethering option allows you to share the same internet connection with any Bluetooth device. Those other devices will see your new hotspot listed alongside other wireless networks. Tap it, then enter the password to connect.

Delete misspelt words from your phone’s dictionary

Your Android device has a list of words in its dictionary that it suggests every time you type certain letters on your keyboard. For example, try typing ‘he’ and you’ll automatically get suggestions such as ‘hello’, ‘he’ll’ and more. Selecting these words from the bar above the keyboard can speed up your typing. If you type a word that’s not in your Android dictionary, your device will automatically add it. But it can be frustrating when you misspell a word once and your device suggests the incorrectly spelt option every time you start typing those letters on your keyboard. Thankfully, there’s a way to delete misspelt words that from your device’s dictionary. Tap Settings, then ‘Language & input’, then tap ‘Personal dictionary’. Tap the word you want to remove, then tap Delete.
Set up separate user accounts on one tablet

Share your Android tablet with other users, whilst keeping your own data private

Just because you share your Android tablet with other people, it doesn’t mean you have to give them access to your personal data too. The guest accounts tool in Android 4.2 (Jelly Bean) or higher lets you share your tablet without sharing your stuff. Here, we show you how to set up separate user accounts on the same device.

**STEP 1**
To create a second user account on your tablet, go to Settings, Users, ‘Add user or profile’ and tap ‘User’. If you’re running Android 4.3 or later, you’ll also see a ‘Restricted profile’ option which we’ll look at in Step 5. Tap OK and ‘Set up now’. To switch to the new account, return to the lock screen. Unlock it by swiping the lock icon down.

**STEP 2**
Pass your tablet to your guest, who will be prompted to sign into or create a Google account. They have to do one or the other, so they should tap ‘Yes’. You can’t bypass this step by tapping No and ‘Not now’, because this loops you round to another Google sign-in screen. Only guests using restricted profiles (see Step 5) are exempt from needing a Google account.

**STEP 3**
Once your guest has signed in, they’ll be taken to their own Google home screen. By default, it includes a huge My Library widget. This can be removed by tapping, holding and dragging it to the top of the screen. Some default apps appear at the bottom of the screen. Tap the apps icon for more apps, and tap and hold an app’s icon to pin it to the home screen.

**STEP 4**
Your guest is automatically logged into Google apps, so they can download Play Store content to your tablet, but only to their account. You can both sign into the same app using your separate accounts, but you should each create screen locks to ensure private access. Tap ‘Settings, Security, ‘Screen lock’, choose your lock type (it’s set to Slide by default) and then enter a code.

**STEP 5**
If you’re running Android 4.3 or later, you can set up a restricted profile with limited app access, similar to a parental-control tool on a PC. Only the tablet owner, can do this. Tap ‘Add user or profile’ (see Step 1) and ‘Restricted profile’, then tap ‘Application and content restrictions’. Tap the sliders to enable specific apps. The restricted user won’t be able to make any in-app purchases.

**STEP 6**
Guest accounts are currently only available on tablets. There are phone apps for creating guest accounts, such as SwitchMe, but they require root access, which we don’t recommend (see page 121). However, Applock (bit.ly/applock327) is root-free, costs nothing and lets you set up user-specific restrictions on any device running Android 2.1 or later.
Turn your Android tablet into a PC

Who needs a laptop these days? With the addition of a few handy peripherals, we’ll show how your Android tablet can be used just like a PC.

Android tablets can be used anywhere, and do pretty much everything a full PC or laptop can. They aren’t as powerful as most PCs, but with the right accessories you can transform your Android device into a serviceable replacement for your Windows computer.

Whether you’re thinking of a complete conversion to a non-PC life, or just want to sideline your desktop and use your tablet to do more, we’ll walk you through the hardware you’ll need.

Add a keyboard

Although there are a lot more keyboards available for the Apple iPad than for Android tablets, you’ll still find plenty that are compatible with devices running Google’s mobile operating system. While keyboards are unquestionably better suited for use with larger tablets (10 inches and upwards), there’s still a decent selection on offer for smaller devices.

Some keyboards include cases and so are designed for a particular make.

Problems with Bluetooth?

You should be able to use almost any Bluetooth compatible keyboard with an Android tablet, depending on how old your device is of course. If it’s running Android 4.1 (Jelly Bean) or higher, you shouldn’t encounter too many problems, although Google released an OS update that caused some Bluetooth keyboards to disconnect after a few seconds on tablets running Android 4.3. There’s no definitive list of affected keyboards, so if you’re running 4.3 you’ll just have to take your chances.
MINI WORKSHOP  Pair a Bluetooth keyboard

**Step 1**
Connecting a keyboard to your tablet via Bluetooth is very easy to do, and no different from connecting to any other device. First enable Bluetooth, if it’s not already active. Open Settings, find the Wireless & Networks section, and tap the Bluetooth switch to On. Tap on the Bluetooth entry.

**Step 2**
Turn on your keyboard. Your tablet will automatically search for any nearby Bluetooth devices. It should find your keyboard and display it under Available Devices. If it doesn’t show there, tap on Search For Devices to check again. If it still can’t find it, turn the keyboard off and on, and try once more.

**Step 3**
Tap on your keyboard under Available Devices and a pairing request window will open. This will include the pairing code you need. Type this code on your Bluetooth keyboard and the connection will be made. To make sure the keyboard is working properly, press the Windows+Esc to jump to your tablet’s home screen.

Some familiar keyboard shortcuts you’re used to on your PC, so you can use Ctrl-X, Ctrl-C and Ctrl-V for Cut, Copy and Paste, and Alt+Tab to switch between apps.

**Add a mouse**
As well as keyboards, Android supports mice and gamepads. You can connect a USB mouse to your device, but not directly because the tablets don’t offer full size USB ports. To get around this you’ll need a USB on-the-go cable (USB OTG) which you can pick up for a few quid on Amazon. This plugs into the micro USB port on your tablet and allows you to connect full-size USB peripherals. Not every Android tablet supports USB OTG, so you’ll need to spend a little time checking whether yours does before you spend any money. If you want to use both a keyboard and mouse, you’ll need to purchase a USB hub, so you can attach more than one device at a time. You’ll need a powered hub as your tablet is unlikely to be able to power multiple USB devices directly.

When you connect a mouse, provided everything is working as it should, a pointer will appear on screen and you’ll be able to move it around as normal, clicking on things instead of tapping them with your finger. You can still use the touchscreen at the same time, however. If your tablet doesn’t support USB OTG, or you’re not a fan of wires, you can still add a compatible mouse via Bluetooth.

**Connect your tablet to monitor**
If your PC has a massive monitor, then trying to use a 7inch or 10inch tablet in its place is going to feel uncomfortable. Fortunately, you might be able to connect your tablet to a large monitor or TV thanks to a technology called MHL – Mobile High-Definition Link. This lets you connect your device to a large screen using HDMI. You’ll need a special cable for this, which you can pick up for between ten and twenty pounds on Amazon – check your model supports MHL first.

As an alternative you could consider purchasing a Google Chromecast (bit.ly/cast345). This is a tiny £30 HDMI dongle that plugs into your TV set and lets you watch streaming video from the likes of YouTube, BBC iPlayer and Google Play. It also lets you browse the web on the big screen by ‘casting’ content from your Chrome browser. See page 102 for more on this.

**The one port problem**
The trouble with tablets is they only have the one micro USB port. You can use this to connect a keyboard or mouse, or hook the device up to a big screen via MHL, but you can’t do all at the same time.

A possible solution to this problem is to use MHL to display the tablet’s screen on your TV, while pairing a keyboard and mouse to the device using Bluetooth. You’ll just need to work out the best combination for your particular needs.

If you send Android to a non-touchscreen, you can use a Bluetooth mouse to control it.

An OTG cables convert microUSB ports into full-sized USB.
Quick fixes

We provide easy answers and simple solutions to many of the problems you might encounter with your Android device.

It can be very frustrating when things don’t work properly, particularly when it’s a device like a phone or tablet that we rely on for so many day-to-day tasks. A battery that runs out too quickly or slow web browsing can make using a device a pain rather than a pleasure. Thankfully, there are often easy ways to solve problems with Android devices, and this chapter is all about providing you with the knowledge needed to fix things when they go wrong. We’ll also offer simple solutions to chores that initially seem complicated, such as transferring your data from an iOS device to an Android one.

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Maximise your battery life

If you’re fed up with running out of juice there are some simple ways to improve your device’s battery life. We show you how.

The batteries in today’s best phones and tablets can last for more than ten hours of continuous use from a single charge, and longer still if used more sporadically.

But if you aren’t careful you may find yourself having to charge your device more often than is necessary. Follow a few simple guidelines, however, and you should be able to keep going as long as the Duracell bunny. The place to start is the screen. Open the Settings menu, tap Battery or Battery Usage, and you’ll see which apps and core elements of your device’s hardware are putting your battery to most use. Chances are, the screen will be at the top of this table; it’s the most power-hungry component, whether you use a phone or a tablet.

If you want your device to last longer between charges, you need to minimise the screen’s power draw, and there are several ways of doing this. The key is to make sure it isn’t on for any longer than necessary, and when it is on, to keep the brightness down as low as possible. Tap Settings, then Display and make sure your device is set to sleep after 15 or 30 second. Tap the Brightness setting to bring up the slider. Drag this to the left to dim the screen.

Data draw

The other key things to consider are the components your device uses to connect to the internet: its mobile data and Wi-Fi adapters. With connectivity at the core of what you do with your phone or tablet, it’s little wonder these give the battery a thorough workout. And with so many apps constantly checking for messages and updates in the background things can quickly get out of hand.

Switch off Wi-Fi and Bluetooth if you don’t need them. At times when you need the extra juice, switch off location access for all apps and services. It’s in the Settings menu, under Location. Then visit the Accounts section of your Settings menu and have a good poke around. You’ll discover you can change when and how often your tablet synchronises your various email and social networking accounts.

There may be other apps without entries here, though – a weather app, for instance, a widget that checks stocks, or a news feed reader. Ask yourself if you really need this information to be updated constantly, or if you can make do with manual updates. If the answer is no, make sure you change the settings of each app individually to make sure it isn’t sneaking onto the internet behind your back.

And last, but by no means least, take a visit to the settings of the Google Play app and make sure that automatic updates for all your apps are switched off. App updates can be quite large, and updating can be a serious drain on your battery, especially over a mobile internet connection.
Make your device’s battery last longer

Get even more help when it comes to conserving battery life, thanks to a handy free app.

On the opposite page we looked at some ways to help save battery life. But you can also use an app like Battery HD (bit.ly/batthd342) to gather information on the biggest drains on your battery and help make it last longer, which could give you those extra few minutes you need the next time you’re out with your phone or tablet.

**STEP 1** Download, install and run Battery HD. The app will display your current battery percentage as well as a summary of how many remaining hours you can expect, depending on how you use the phone. Swipe left to get a more detailed list of activities.

**STEP 2** On the app’s home screen, select the cog in the top left and then tap Notification. Here you can add a charge level percentage to your notification area or choose to display the time remaining for two different types of activity in your notification drawer.

**STEP 3** To be alerted when your battery has drained by a certain amount, go to Settings, tap ‘Charge level alerts’ and then ‘Enabled levels’. Here you can select the charge percentages at which you will receive a notification. Tap the back arrow and choose a combination of sound, voice or vibration alerts.

**STEP 4** In settings you can also select ‘Live wallpaper...’ to make your Android show a live representation of your battery charge level on your home and lock screens. Tap settings and a side bar will appear where you can tap the up and down arrows or percentage symbol to customise the animation.

**STEP 5** On the app’s home screen tap the graph symbol below the cog. Here you will see a detailed graph of your battery usage over time. Use the plus and minus buttons to change the scale of the graph or tap the percentage symbol to toggle through other graphs displaying voltage or temperature.

**STEP 6** Return to the home screen and select the three-lined symbol. Here, Battery HD draws your attention to some native Android features including Usage, a summary of the proportion of battery usage that each app is responsible for since charging. Tap any app for more information or to quit or uninstall it.
Speed up your tablet or phone

Is your Android device slowing to a crawl? We reveal the best free ways to get things back up to speed again.

It's a fact of life that our tablets and smartphones get slower over time, as their storage and memory get used up, and everyday tasks start to take their toll. Using a device that's unresponsive or laggy is more than just an inconvenience too - it can cause deep frustration to the point where you may no longer be inclined to use the device. Fortunately, there are lots of free tools and tricks you can employ to speed up your devices, and reclaim some valuable time. Here, we've rounded up some of the best ways to make everything faster without having to pay for expensive upgrades. We'll show you how to overclock your devices without damaging them, speed up your OS by turning off unnecessary features, restore changed settings to their factory defaults, remove junk software, unlock hidden settings and much more.

**TIP 1** Turn off live wallpaper and widgets

Live wallpaper - such as animated weather scenes - and widgets that update frequently can adversely affect your Android device's battery life and performance. To keep your phone or tablet running smoothly, it's a good idea to change the wallpaper to a static image. You can either do this by going to Settings, Display (or similar) and choosing Wallpaper or long-press an empty space on the home screen and select a wallpaper. To remove widgets, simply long-press them and drag them to the Remove option at the top or bottom of the screen.

**TIP 2** Disable animations through Developer Options

Android devices come with a hidden Developer Options screen that unlocks bonus features on your phone, including the ability to limit resource-hungry animations. Click on Menu, go to Settings, About Phone and scroll down to the Build Number. Tap this seven times, and go back to Settings. You'll see a new Developer Options menu. You shouldn't change anything in this unless you know what you're doing, but it's safe to tap the three animation settings shown here and change each one to .5x. This will make your device feel a lot smoother.
TIP 3

Restore settings to their defaults
If your Android phone or tablet has started to become really sluggish, and uninstalling applications hasn’t had the desired effect, it might be time to take more drastic action and reset it to the factory defaults. Press the Menu button, go to Settings and look for ‘Backup and reset’, or similar. If the setting isn’t there, look in the Privacy section. Scroll down to ‘Factory data reset’. Everything will be wiped so make sure you have backed up all your important personal data beforehand. See page 114 for some ways to back up your data safely.

TIP 4

Free up memory and space using AVG Cleaner
Cached data can build up over time on your device and significantly slow it down. Although you can delete individual caches through the Apps menu, it’s much easier to use a dedicated cleaning tool. One of the best is AVG Memory & Cache Cleaner (bit.ly/avgcleaner332), which can erase your browser, call and text histories, as well as remove cached app data from your phone’s internal memory and SD card. The app shows you how much memory can be saved by deleting these files and you can set up weekly cache cleaning to free up memory and boost performance automatically.

TIP 5

Change your Android keyboard
The keyboard you use on your Android phone is probably fine, but there are better third-party keyboard apps available. These can significantly reduce the time it takes to write emails and craft text messages. SwiftKey (bit.ly/swiftkey332) is excellent and intelligently predicts what you’re going to say based on how you write. It costs £1.49, but is well worth the money. Alternatively, you could try Google’s own free Keyboard app (bit.ly/googlekeyboard332), which is designed to help you type faster using gestures. These let you glide through letters rather than tapping them individually, and lift your finger to finish a word instead of pressing the Space bar.

TIP 6

Install a custom ROM
Rooting your Android phone or tablet allows you to overclock it and also lets you install a custom ROM. This is basically an alternative operating system that replaces the supplied firmware, and gives you extra tools and options, including some that can boost the performance of your device. One of the most popular ROMs is CyanogenMod (www.cyanogenmod.org), which you can download for a wide range of Android phones and tablets – see the list of supported devices at bit.ly/cyan332. Its features include support for themes; enhanced sound-processing capabilities; and instant access to settings through the notification bar. Rooting your device is not recommended for all, though. See page 121.
**TIP 7**

Uninstall unneeded apps
Unused apps don’t just take up space unnecessarily, they can also slow down your Android device, either by running unnoticed in the background or by taking up memory – some devices slow down noticeably when their available internal storage dips below about 10 per cent. It’s good practice to go through your apps every now and then and remove ones you don’t need. You can do this by opening the App drawer and long-tapping any apps you no longer want, then dragging it up to the Uninstall icon at the top of your screen. Alternatively, you can tap Settings, then Apps and tap on individual apps and tap Uninstall to remove them. If you decide you want the app back at some point you can always reinstall it from Google Play.

**TIP 8**

Speed up your browsing
If you find Chrome a little slow, then you could try switching to one of our recommended alternatives instead – head back to page 56 to find out how. But there’s another hack that some users have found makes Chrome itself feel a bit snappier. Open Chrome, then type this address into the browser exactly as it’s printed here: chrome://flags/#max-tiles-for-interest-area. Tap Go and a page will load. Tap the Default button just under where it says ‘Maximum tiles for interest area’ and select 512 – this will assign more memory to the browser. If overall performance of your device appears to suffer as a result, then repeat the process and set the amount to 256 to see if that’s any better or switch back to Default.

**TIP 9**

Play typing-training games
If you followed our advice in Tip 5 but are still finding touch-screen typing too slow-going, there are lots of free apps that help improve your typing skills without making you input big blocks of text. Our favourite for Android is Typeit (bit.ly/typeit323), which asks you to type words that appear onscreen as quickly as you can. The faster you enter them and the fewer mistakes you make, the more points you score, and you unlock achievements as you become more dexterous. You can switch between a horizontal and vertical keyboard, or make things more interesting by competing with other users.

**TIP 10**

Use an external keyboard
If you really don’t enjoy typing on a touchscreen, but find you can type quite quickly on a PC, then you could consider adding a physical keyboard to your Android device – at least for those moments when you need to type a lot of text quickly, such as when you’re writing a document, for instance. Several companies, including Logitech, Belkin and Anker, produce Bluetooth keyboards that you can connect wirelessly to your phone or tablet. Some are even small enough to slip into your jacket pocket or bag, so you can type as quickly and comfortably on the move as you can at your PC. Many external keyboards even include a built-in stand for your device. Prices start at around £18 on Amazon (bit.ly/bluetooth323). See page 130 for more advice on using a keyboard.
Hide Everything you do from prying eyes

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Cure common problems

Our quick cures will restore ailing devices back to health and generally improve your smartphone or tablet experience.

Smartphones and tablets are now central to many people’s lives. No gadget is perfect, though, and we often end up learning to live with the quirks and annoyances of our chosen model, whether that’s unwanted notifications, apps eating up too much data, or anything else.

We are going to show you how to fix these problems, and many more besides, quickly, easily and for free. Most of the fixes will work on all devices, but remember that the screens may look different on your phone or tablet, as each manufacturer can change how Android looks and works.

**TIP 1**

Diagnose a problem with your device

When your Android smartphone or tablet is misbehaving, there are some standard techniques you can employ to try and resolve the problem. If an app is unresponsive, for example, try closing it and restarting it. If that doesn’t work, tap Settings, then Apps and tap the app in question. Here, tap ‘Clear cache’ and try your app again. Still not working? Go back to the app settings and this time tap ‘Clear data’. If that doesn’t have any effect, try restarting your device. Finally, try uninstalling and reinstalling the app. For other Android problems, a restart can often be the solution. Also, check for updates – your device may be in need of a bug fix. Tap Settings, then ‘About phone’ (or ‘About tablet’), then ‘System updates’ and tap ‘Check now’.

**TIP 2**

Automatically update your apps

Updating smartphone and tablet apps manually is a pain – if you have a lot of apps installed you’ll probably find new updates almost every day. Luckily, you can let Google Play handle all the updating for you automatically. To do so, tap Play Store, then the Menu button (three vertically-aligned dots; older devices may have a real ‘menu’ button too), followed by Settings and tick the ‘Auto-update apps’ box. If you use an Android phone or tablet with built-in 3G/4G data access, we suggest ticking ‘Auto-update apps over Wi-Fi only’, or you could find you quickly burn through your mobile data allowance if big updates become available.
Get a better browser

Chrome and the older 'stock' Android web browsers are fine for most people but not everybody likes them. Unlike iOS, however, Android users can change the default web browser. Download one of the browsers we recommended on page 56 – Opera and Dolphin are two good options. When you next tap a web link, you will be asked which browser to use. On older devices, tick the 'Use by default for this action' box. On more recent ones, you will be asked to tap the app you want to use, and then below you can choose 'Just once' or 'Always' – tapping the latter will make the browser your default. To change this later, tap Settings followed by Applications, then tap the app that's the current default, then Clear defaults.

Monitor data use

Reduce the chance of overshooting a mobile data allowance by tapping Settings then Data usage. Tap 'Data usage cycle' to reset the counter on the day your monthly allowance begins, drag the orange bar to set a warning level, and the red one to create a hard limit. The 'Set mobile data limit' tick box can also be used to automatically cut mobile data off when the limit is reached. Leave it unticked to see how much you are using on the graph.

Ensure a peaceful sleep

Ever been woken up by someone ringing or texting you in the middle of the night? Even if your device is on silent, the vibration buzz is often enough to wake you up. You could turn your phone or tablet off at night, but what if you need to make an emergency call? Instead you could Download Timerific (from www.snipca.com/78222) to control when your phone will ring, vibrate or remain silent. For more control, you can use tools like CallWeaver and PhoneWeaver, so that some people can reach you, while others will just get your voicemail.

Prevent typos

Android has a handy auto-correction feature that's intended to help prevent typing errors but, unfortunately, it can sometimes cause them too by incorrectly identifying a mistake. If you find this annoying, tap Settings, then 'Language and input', and tap the settings icon to the right of the main keyboard (the name of which depends on the device and Android version). Now tap 'Auto-correction' and either change the setting here to Modest or switch it off altogether.
Slow the battery drain
As we saw on page 134, there are various ways to squeeze more from an Android gadget's battery. One of our suggestions was to disable Bluetooth and Wi-Fi (both in Settings). If you don't want to disable Wi-Fi altogether, though, you may be able to make use of some useful Android power saving tricks. Tap on Wi-Fi, then tap the Settings (three dots) button and select Advanced. Here, make sure the 'Wi-Fi optimisation' option is checked. Tap Keep Wi-Fi on during sleep and switch this to 'Only when plugged in'.

Always view full websites
Some websites automatically detect when you're using a smartphone or tablet and redirect your browser to a dimmed-down 'mobile' version of the site. Often, however, mobile sites can be over-simplified or harder to navigate. Thankfully, Chrome (in Android 4 and later) includes a 'Request desktop site' option. Tap the Menu (three dots) button and scroll down to see it. Users of older Android devices should try the Dolphin browser (get it from www.snipca.com/7829). Launch Dolphin, tap Menu then More followed by Settings and set User Agent to Desktop.

Banish those bad vibrations
Some Android devices are set to vibrate momentarily when buttons are tapped, such as when you're typing on the keyboard, known as haptic feedback. It's a matter of taste but some people hate it. And if you're one of those people, you'll be pleased to learn that you can easily switch this feature off if you don't like it. Tap Settings, then Sound – look for the 'Vibrate on touch' setting and uncheck it.

Limit notification annoyance
To prevent apps from displaying messages in the Notifications area (which you see by dragging down from the top of the screen), open the app in question, tap the Menu button, followed by Settings, and clear the Notifications box. You can also disable notifications for an app by going to the device's main Settings screen and choosing Apps. Tap the name of application and when its info screen appears, untick the 'Show notifications' box. If you see a warning message, tap OK to confirm your choice.
TIP 11  Silence audio apps after a set time
Most of us have made the mistake of falling asleep and waking up to realize that our music, podcast or audiobook was playing on our phone or tablet while we slept. A new free app called Super Simple Sleep Timer lets you create a timer to silence any audio or video app after a set period of time. To do this, install the app (www.snipca.com/11228) and launch it. By default all your audio and video apps are selected in the All dropdown menu at the top. You can select only the app you’re using by tapping the ‘All’ dropdown and selecting the app. Drag the circular dial below from 0 to any point on the digital clock to select a time in minutes. Tap the Set Sleep Timer button. All your audio apps (or just the app you selected) will automatically close after the time you set. You can switch between a Light and a Dark theme by sliding the fader at the top right.

TIP 12  Remotely lock or erase a stolen device
Android Device Manager (www.snipca.com/11008) is a free app that lets you lock and erase data on your device if you think it’s stolen. You can also make the device ring on full volume for five minutes to track its location. Sign into your Google account and allow the app to use your location settings so it can track your device’s whereabouts. Run through the ‘Set up Lock & Erase’ and ‘Set up remote lock and factory reset’ procedures and ensure the options ‘Remotely locate this device’ and ‘Allow remote lock and factory reset’ are ticked. You can now ring, lock or erase data on your device by signing into Google on your PC and going to www.snipca.com/11006.

TIP 13  Revive an unresponsive device
If your smartphone or tablet is completely unresponsive, this is almost certainly due to the fact that the battery is flat. And don’t be alarmed if it doesn’t initially show any signs of life when plugged in to charge. Some devices take quite a while to come back to life if the juice has been completely drained. Leave the device for a few minutes, then return and press the power button. You should now see the battery charging icon in the middle of the screen as shown. If not, then the problem is likely to be more serious and you may need to contact the vendor or manufacturer.

TIP 14  Read Google’s Android manual
For even more help and advice, you can download Google’s ‘secret’ free guidebook to Android, which you can find in the Google Play store. Open the Play store on your device and tap Books. Tap the magnifying glass, then type ‘android quick’ into the search box. Select the book entitled ‘Android Quick Start Guide’ for your device, then tap Add To Library. Exit Google Play and return to the full list of apps and tap Play Books. Tap My Library and then the book to start reading. Although the books are designed for Nexus tablets and phones, the advice applies to most Android devices.
Easily switch from iOS to Android using a PC

Ditching Apple and switching to Android? We explain how to make the move without losing any data.

Android and iOS are like chalk and cheese – there's no easy way to transfer data from one platform to the other. Switching from one smartphone or tablet to another isn't just about copying contacts from your old SIM, either. You'll need to transfer photos, videos, music and more. Google executive chairman, Eric Schmidt, recently wrote a guide on converting from iOS to Android using a Mac and a PC (www.snipca.com/10981), but we'll show you how to make the switch solely using a PC. In this Workshop, you'll learn to transfer all your most important data, such as contacts, images, videos and music files that you've downloaded on your iOS device to your Android device. All you need to get started is a primary Gmail account. Pay careful attention as we swap between iOS, Android and PC in the steps below.

STEP 1
On your Android device, download and sign into the apps you use most often on your iOS device. You can do this by clicking the Play store icon and searching for apps that you want to download. Open Drive on your Android device from www.snipca.com/10980 as you'll use it to transfer all your images and videos later in this tutorial. Use your Gmail account to sign into Google Drive. Update your iOS device to iOS 7.0.4 or above by tapping the Settings app, then General and Software Update.

STEP 2
Now go to your PC. To transfer your Contacts from iOS to Android, open your web browser and go to www.icloud.com. Sign in with your Apple ID and password. Click Contacts to see a list of all your contacts. Select them all by clicking Ctrl+A. Click the Actions Menu (cog icon) in the bottom left of the iCloud screen and select ‘Export vCard...’. A vCard contains all the contact information you have selected as a .vcf file. This file will now download to your PC's default Downloads folder.

STEP 3
Next, sign into your Gmail account on your PC. Click the main Gmail menu on the top left and select Contacts. Click More and select ‘Import...’. Click Choose File, select the vCard you downloaded and click Import. All your contacts will now appear in your Gmail. To get these contacts on your Android device, open the Contacts app on your Android device, tap Menu, Accounts, then select your Gmail account. Tap OK. All your iOS contacts will now appear in the Contacts app of your Android device.
**STEP 4**

Now we’ll sync your photo and video files between iOS and Android. On your iOS device, download and sign into the Google Drive app (www.snipca.com/10975) using your Gmail account. Launch Google Drive and tap the top-left parallel lines. Select Uploads. Now tap the ‘+’ sign in the top right. Select ‘Upload Photos or Video’. Your iOS photos and videos will now be displayed. Select the items you want to upload by tapping them individually and then tap the blue tick icon in the top right. Your files will begin uploading. Next, on your Android device, tap the Google Drive app to see your uploaded iOS files.

**STEP 5**

If you want your photos and videos to appear in your Android Gallery app, first download Google Drive for your desktop PC from www.drive.google.com and sign in. Connect your Android device to your PC via a USB cable. Select your device and in the list of folders on your PC, make a new one and name it. Copy and paste the photo and video files from Google Drive into this folder. Your Gallery app will now contain the new folder with all your files.

**STEP 6**

To import music you’ve bought from iTunes to your Android device, first sign into iTunes on your PC. Now click the small dropdown menu in the top left, then click Preferences. Click the Store tab and ensure ‘Show iTunes in the Cloud purchases’ is ticked. Click OK. In iTunes, click the iCloud icon beside tracks or albums to download your music. This will download any iTunes music you’ve bought to your PC.

**STEP 7**

On your PC, go to play.google.com/music and click ‘Upload music’ next to the top-right settings icon. Click Download Music Manager and install it. Click Next when the option ‘Upload songs to Google Play’ appears. Make sure iTunes is selected. Click Next again to download your music from iTunes. Once the upload is complete you’ll see all your music files in Google Play Music. Download the app on your Android device (www.snipca.com/10982) and enjoy all your iTunes music for free. See page 98 for more on using this tool.
### Glossary

**3G/4G**
Names for types of data connection that allow internet access over mobile phone networks.

**Backup**
The process of copying your important files to protect against loss of the originals.

**Bandwidth**
A measure of the amount of data that can be transferred over a connection at any one time.

**Bluetooth**
A technology that allows devices to communicate wirelessly over short distances.

**Browser**
Short for web browser – an app that lets you view pages on the internet.

**Cloud**
A nickname given to web-based services, such as online storage and syncing tools.

**DRM**
Digital Rights Management. Software that limits the usage and copying of a file.

**Encrypt**
To scramble data so that it can only be read by those with a key or a code.

**Firmware**
Software permanently stored on a device, such as a mobile phone, that controls its basic operation.

**GPS**
Global Positioning System. Technology used to pinpoint an exact position on the planet.

**HDMI**
High Definition Multimedia Interface. A type of connection that transmits HD video and audio.

**Hotspot**
A public area covered by a wireless network that allows you to access the internet.

**iOS**
The operating system used by portable devices from Apple, such as the iPhone and iPad.

**IPS**
A display technology that boast superior colours and viewing angles to standard TFT screens.

**Jelly Bean**
The codename for Android versions 4.1 to 4.3, still found on many devices.

**KitKat**
The codename for Android version 4.4 – named after the chocolate bar.

**Linux**
Open source software that’s used as the basis for many operating systems, including Android.

**Megapixel**
A measure of the amount of detail that can be recorded by a digital camera or cameraphone.

**Memory**
A device’s temporary storage area, usually measured in gigabytes (GB).

**Memory card**
Small, plastic cards that can be used by some phones and tablets to expand storage capacity.

**MP4**
A type of digital movie format often used by portable devices, such as tablets and phones.

**Multitouch**
The ability of a touchscreen to accept input from multiple points on a screen simultaneously.

**Operating system**
Governs the way that the hardware and software in a mobile device or computer work together.

**OTG**
Short for On The Go. A type of USB connection used by many tablets and phones.

**Panorama**
A type of photo, where you pan your camera from left to right to capture one long image.

**Processor**
The processor is the ‘brain’ of a device or a computer, governing performance. Also known as a CPU.

**Resolution**
The amount of detail shown in an image, whether on-screen or printed.

**Rip**
To digitally copy the music data from an audio CD to another format, such as MP3.

**Router**
A device used to connect PCs and wireless devices, such as phones and tablets, to the internet.

**SD card**
And microSD. Popular types of memory card used for storage in some phones and tablets.

**Server**
A computer device on a network that distributes information to other PCs and devices.

**SIM**
Subscriber Identity Module. The card used by phones (and some tablets) to access mobile networks.

**Speech recognition**
A technology that recognises the spoken word and translates it into commands or text.

**Streaming**
A way of transmitting audio or video data without having to download an entire file first.

**Stylus**
A pen-like input device sometimes used for writing directly onto a tablet or smartphone screen.

**Tag**
A keyword used to describe and identify a file – also known as metadata.

**Tethering**
A technique that allows you to set up a portable hotspot using your smartphone’s mobile data connection.

**USB**
Universal Serial Bus. A common standard for connecting devices and computers.

**Virus**
Malicious software designed to multiply itself, spreading from device to device and often damaging data.

**Wi-Fi**
An umbrella term for various types of wireless networking technologies.
Discover how to...

- Choose the best Android device for you
- Use secret hacks to improve your device
- Keep all your personal data private and safe
- Stream great music, movies and TV for free
- Fix frustrating problems quickly and easily
- Install great apps for everything you need
- Get answers to all your Android questions