

1

Introducing Android Phones

7

About Android	8
About Android Phones	9
Updating Android	10
Android Overlays	11
Makes and Models	12
Features of Android 13	14
Features of Android Phones	16
SIM Cards	18
Setting Up Your Phone	19
Android and Google	20
Creating a Google Account	22
Using a Touchscreen	24
Using Apps	26

2

Android Settings

27

Accessing Settings	28
Communication Settings	29
Customization Settings	30
Security Settings	32
Organization Settings	34
Wellbeing and Accessibility Settings	36
Google and Phone Settings	38
Quick Settings	40

3

Around an Android Phone

41

Viewing the Home Screen	42
Navigating Around	43
Adding Apps to Home	46
Moving Apps	47

Working with Favorites	48
Creating Folders	49
Adding Widgets	50
Changing the Background	52
Using Notifications	54
Locking Your Phone	56
Searching	58
Google Assistant Search	60
Hey Google	62
Using Google Discover	65

4

Calls and Contacts

67

Adding Contacts	68
Saving Contacts from Calls	70
Saving Contacts from Texts	71
Editing Contacts	72
Managing Contacts	74
Making a Call	76
Receiving a Call	78
Setting Ringtones	81

5

Using the Keyboard

83

Keyboards with Android	84
Selecting Keyboards	85
About the Google Keyboard	86
Keyboard Settings	88
Gboard Suggestion Strip	90
General Keyboard Shortcuts	92
Adding Text	93
Working with Text	94

6

Messaging and Email

95

Texting Contacts	96
Using Emojis	98
Adding Attachments	100
Sending a Voice Note	101
Setting Up Email	102
Using Gmail	104
Going Hands-free	106

7

Android Apps

107

Apps for Android	108
Google Apps	110
Maps	112
Notes and Memos	114
Social Media	115
Health and Fitness	116
Playing Games	117
Around the Play Store	118
Finding Apps	120
Downloading Apps	122
Uninstalling Apps	124
Updating Apps	126
App Information	128

8

Being Entertained

129

Music on Android	130
Media Player	134
Google TV	135
Obtaining Ebooks	138
Around an Ebook	140

9**Getting Things Done****141**

Google Productivity Apps	142
Google Drive	143
Google Docs	146
Google Sheets	150
Google Slides	152

10**Keeping in the Picture****153**

Using Cameras	154
Adding Photos	156
Viewing Photos	158
Adding Albums	161
Editing Photos	162
Sharing Photos	164

11**Online with Chrome****165**

Android Web Browsers	166
Opening Pages	167
Bookmarking Pages	168
Links and Images	170
Using Tabs	171
Being Incognito	172
Browser Settings	173

12**Staying Secure****175**

Security Issues	176
About Antivirus Apps	177
Security and Privacy	178
Digital Wellbeing	182
Parental Controls	184
Locating Your Phone	186

1

Introducing Android Phones

Smartphones using the Android operating system are the most used phones worldwide.

This chapter gives an overview of Android on a smartphone, to get started using it. It also looks at creating a Google Account for using Google services on your Android phone.

- 8** About Android
- 9** About Android Phones
- 10** Updating Android
- 11** Android Overlays
- 12** Makes and Models
- 14** Features of Android 13
- 16** Features of Android Phones
- 18** SIM Cards
- 19** Setting Up Your Phone
- 20** Android and Google
- 22** Creating a Google Account
- 24** Using a Touchscreen
- 26** Using Apps



Android is based on the flexible and robust Linux operating system and shares many similarities with it.



Android on a Google Pixel is the purest form of the operating system since, unlike other manufacturers who use Android on their phones, there is no customization to the operating system. The examples in this book are provided using a Google Pixel with Android 13, the most widely used version of Android at the time of printing.



The **New** icon pictured above indicates a new or enhanced feature introduced with Android phones using Android 13.

About Android

Android is essentially a mobile computing operating system – i.e. one for mobile devices such as smartphones and tablets.

Android is an open source operating system, which means that the source code is made available to hardware manufacturers and developers so that they can design their devices and apps in conjunction with Android. This has created a large community of Android developers, and also means that Android is not tied to one specific device; individual manufacturers can use it (as long as they meet certain specific criteria), which has led to Android being available on a variety of different devices.

Android Inc. was founded in 2003, and the eponymous operating system was initially developed for mobile devices. Google quickly saw this as an opportunity to enter the smartphone and tablet market and bought Android in 2005. The first Android-powered smartphone appeared in 2008 and since then has gone from strength to strength. Android-based smartphones have a majority of the worldwide market, and Android is used by numerous manufacturers on their handsets.

The main differences between the Android mobile operating system and desktop- or laptop-based ones such as Windows or macOS are:

- **No file structure.** There is no default built-in file manager structure for storing and managing files. All content is saved within the app in which it is created.
- **Self-contained apps.** Because there is no file structure, apps are generally self-contained and do not communicate with each other, unless required.
- **Numerous Home screens.** There are numerous Home screens on an Android phone, and they can be used to store and access apps.
- **Generally, content is saved automatically as it is created.** Apps save content as it is created, so there is no Save or Save As function within many apps.

About Android Phones

Android has been used on smartphones since 2008. Initially adoption was fairly slow, but this has now accelerated to the point where Android is the most widely used operating system on smartphones.

Combinations of Android phones

Since Android can be used by different manufacturers, this means that a range of the latest smartphones always run on Android. In addition, since not all older phones are designed to be upgraded to the latest version of Android, there are phones running several different versions of Android – for instance, the Google Pixel 6 runs the latest version of Android (at the time of printing, Android 15), while some models of older phones may still only be able to run Android 10 or earlier. As a result, there are hundreds of combinations in terms of smartphone models and versions of Android on the market. Some are the expensive flagship models, which will run a relatively new version of Android (although not necessarily the very latest version) compared with cheaper models that can only run an older version of Android.

Checking for versions of Android

When buying an Android phone, look at the version of Android in the phone's specification. Ideally, it should be a relatively new version in order to enable it to be upgraded to the latest version when it becomes available. Some models of Android phones reach a point where they do not have the required hardware to update to the next version of Android and are therefore stuck with the current version that they are using. This may also limit the phone's ability to download and use the latest apps that are available.

Android phone differences

Despite the variations in versions of Android, the user experience is generally similar on different Android phones. However, one area of difference is in the hardware used by manufacturers. For instance, some newer Android phones have face recognition (**Face Unlock**) or fingerprint sensors for unlocking the phone, and others have more sophisticated cameras.



Updated versions of Android were historically named alphabetically after items of confectionery but are now named numerically.



Due to the range of versions of Android on smartphones, it is not feasible to cover all possibilities across different manufacturers. Therefore, this book will focus on the standard functionality of Android that is available through all versions of the operating system.



Much of the general functionality of the Android operating system is the same, regardless of the version being used.



For more details about Android settings, see Chapter 2.

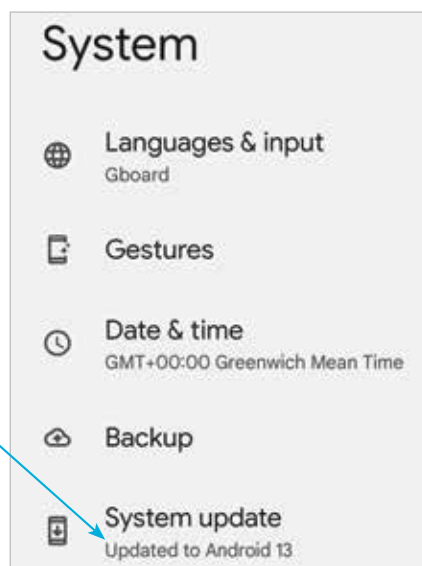


Updating Android

Since Android is open source and can be used on a variety of different devices, this can sometimes cause delays in updating the operating system on the full range of eligible Android devices. This is because it has to be tailored specifically for each different device; it is not a case of “one size fits all.” This can lead to delays in the latest version being rolled out to all compatible devices. The product cycle for new versions is usually six to nine months.

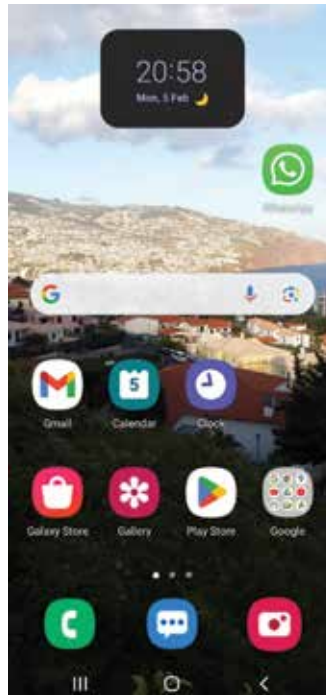
As Android is a Google product, Google’s own devices are usually the first ones to run the latest version of the software. Therefore, the Google Pixel was the first phone to run the latest version of Android – 15 – while others are still running previous versions, covering a range of releases over several years. The majority of Android phones have versions that are usually at least a couple of years behind the latest version, with Android 13 currently being the most widely used. For recently released phones, an upgrade to the latest version of Android will be scheduled into the update calendar or it might be already available to install. However, for some older Android phones the latest version of the software is not always made available, usually because of hardware limitations within the phones.

The version of the Android operating system that is being used on your phone can be viewed from within the **System update** section of the **Settings** app. This is where details of the current version of Android can be viewed.



Android Overlays

Because Android is an open source operating system, it means that manufacturers can amend it, to a certain extent, when they add it to their phone models. This keeps the core Android operating system, but the user interface can be adapted so that it becomes specific to each manufacturer. This is known as an “overlay” and means that the appearance of Android will be different on, for instance, a Samsung phone and an HTC one. However, the operation of Android will still be the same on different brands of phones and, in most cases, the appearance of the user interface will be very similar and still recognizable as Android.



If you are familiar with one brand of Android phone and then switch to another, it may take a little while to get used to the overlay of the new phone. However, the underlying functionality should be the same.

In addition to overlays, manufacturers can also add their own apps to their brand of Android phone and, in some cases, have their own app store for downloading more apps.

The one phone that does not have any kind of overlay is the Google Pixel: since Google owns Android, it uses the operating system in its purest form on its phones.



Check the overall size of any phone in which you are interested to ensure it fits in one hand comfortably. Also, check the weight to make sure that it is not too heavy.



"Selfies" are photos taken of yourself, using the front-facing camera (on the screen of the phone).

Makes and Models

There is a significant range of companies that manufacture Android smartphones, and some of the features to look for in any of them are:

- Display screen size, which is measured diagonally.
- RAM (random-access memory). This is the internal memory that processes the operation of the phone. Look for a minimum of 4-6 gigabytes (GB).
- Memory. This is the internal memory for storing content. Look for a minimum of 64-128 GB.
- Operating system. Look for the version of Android being used and the latest version to which it is upgradable.
- Main camera. This is used for most photo options (except selfies), and the larger the megapixels (MP) count, the better. Look for a minimum of 48 MP.
- Face ID or fingerprint sensor for unlocking the phone.
- Battery. Look for a battery with as long a charge life as possible, and also fast-charging capabilities.

Samsung

Samsung is the market leader in terms of the number of smartphones sold globally, partly due to the fact that it offers a considerable range of models, including its flagship Galaxy range. Several Samsung smartphones models use the TouchWiz interface as an overlay for Android.

Google Pixel

Since Android is owned by Google, it makes sense for it to have its own Android phone, the Google Pixel, which comes in a standard model or in a Pro model. The Google Pixel is a high-specification smartphone and, unlike the majority of Android phones on the market, comes with the latest version of Android (15 at the time of printing). Also, the Google Pixel will be the first phone that can update to the next version of Android when it is released.

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Sony

Sony is another major player in the smartphone market and has a reputation for producing phones with particularly high-quality cameras. The flagship Sony Android phone is the Xperia range.

Huawei

Huawei is a major Chinese technology company that produces a wide range of communications devices, including smartphones. Most Huawei phones that use Android also use the Emotion User Interface (EMUI) overlay.

HTC

HTC is a Taiwanese company that was at the forefront of the development of smartphones using the Android operating system. Despite an up-and-down performance in the smartphone market, HTC has produced a successful range of phones, with one of the high-end models being the HTC Desire Pro.

Nokia

Nokia has a long history of producing cell/mobile phones, and although there have been some breaks for the Nokia brand, it is again well established, with a range of smartphones that run on Android.

Lenovo

Lenovo is a large Chinese technology company that produces personal computers, laptops, tablets and smartphones. It owns the Motorola brand, which has its own website, and now uses this branding for its smartphones instead of using the Lenovo brand.

Motorola

Although the Motorola brand is owned by Lenovo and sold via its website with this branding, Motorola smartphones can also be bought from the Motorola website, with particular emphasis on the **moto g** range.



Different geographical regions can offer their own ranges of Android smartphones.



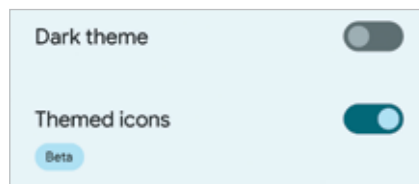
The features on these two pages are all updates from previous versions of Android.

Features of Android 13

Although Android 14 and 15 are both newer versions than Android 13, they are only available on a limited number of Android phones, and version 13 has a higher adoption rate. The majority of features are the same as for earlier versions of Android and are consistent across different brands of Android phone. However, there are also some new Android 13 features:

Customizable app icons

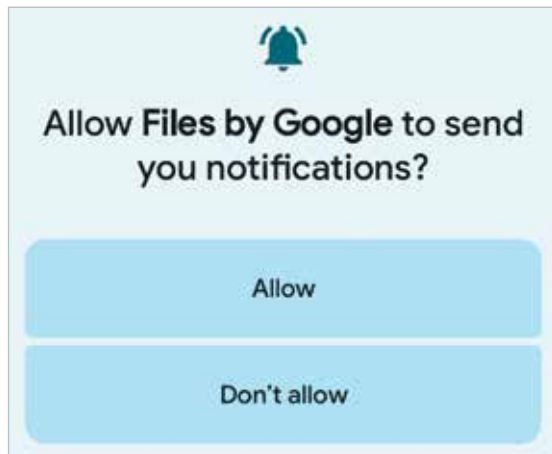
Android 13 offers a customization option so that the app icons on your Home screen can be changed to have the same overall color theme as the background being used. If the background changes, then so does the color theme for the app icons. This customization feature can be applied in the **Wallpaper & style** category of the **Settings** app, using the **Themed icons** option.



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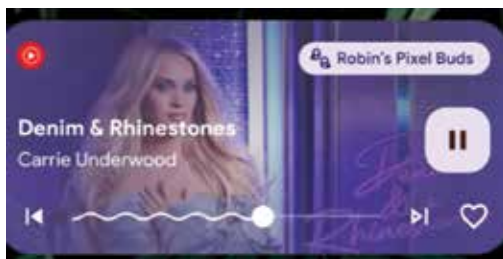
Notifications

The way in which notifications are dealt with is another feature that has been updated in Android 13. **In Settings > Notifications** there is a range of options for managing notifications, and when a new app is opened, the default option that appears enables you to immediately allow, or not allow, notifications to be sent from this app. This means that you can always be in control of which notifications appear.



Updated Media Player

The Media Player that is provided with Android 13, for playing music and podcasts, has also been updated. This includes displaying cover artwork when an item is playing, and also an animated playback bar at the bottom of the Media Player that oscillates when an item is playing. The new Media Player does not work with all apps, particularly some non-Google ones.



The new Media Player is only activated when the Lock screen is on and music or podcasts are already playing. If the phone is unlocked, the content will play in its own app.



If the Android operating system is updated on a phone, it will probably restart before the update takes effect.

Features of Android Phones

The button for turning a phone on and off is located on the side of the body of the device in most cases, as are the other buttons and ports that can be used for various functions on your phone.

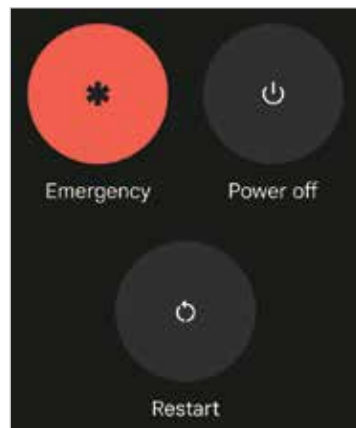
On/Off button

This can also be used to put the phone into **Sleep** mode. Press and hold for a couple of seconds to turn on the phone. Press once to put it to sleep or wake it up from sleep.



Turning off

To turn off an Android phone, press and hold on the **On/Off** button until the **Power off** button appears on the screen. Tap on this to turn the phone off. Tap on **Restart** to shut down the phone and then start it again.



Volume button

This is either a single button on the opposite side to the **On/Off** button or two separate buttons. Press the buttons to adjust the volume.

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Cameras

There is the main, rear-facing camera (on the back of the phone) for taking pictures. Most phones also have a front-facing camera (on the screen side of the phone), which is usually a lower resolution and is useful for making video calls or taking “selfies” (see page 12), as the user can view the screen at the same time as using the camera.



Headphone jack

This is used to connect a headphone cable and is usually at the top or bottom of the phone.

Micro USB port

This can be used to attach the phone to an adapter for charging the phone or to a computer for charging or to download content from (or upload to) the phone, using the supplied USB cable. Once the phone is connected to a computer it will show up as a removable drive in the file manager, in the same way as an item such as a flashdrive.



microSD cards

These can be inserted into the appropriate slot on the body of the phone to increase the amount of storage for items such as photos and music.



An increasing number of phones, particularly the higher-end models, have a fingerprint sensor on the body of the phone that can be used to unlock the phone with a unique fingerprint. Fingerprint sensors have to be set up by using the applicable item (usually in the **Settings** app) and then pressing on the sensor several times so that it can identify your unique fingerprint. More than one fingerprint can usually be set up for use with the sensor (see pages 56-57 for details about how to set this up). Some phones also use face recognition for unlocking the phone.



SIM cards usually use 3G, 4G or 5G networks for providing cellular phone and data services – e.g. texting and messaging. 5G is the fastest, but is not currently as widely available as 4G. The G in the name stands for Generation.

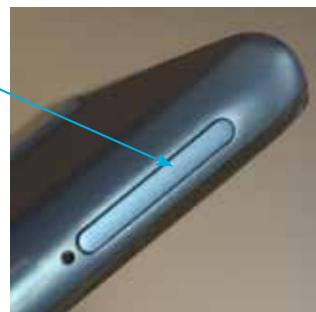


Some models of Android phones also have an option to use an eSIM. An eSIM is a digital SIM that allows you to activate a mobile data plan from your network provider without having to use a physical SIM card. eSIM cards can be more secure as there are no physical cards to be removed.

SIM Cards

The SIM card for your Android phone will be provided by your mobile carrier – i.e. the company that provides your cellular phone and data services. Without this, you would still be able to communicate using your phone, but only via Wi-Fi and compatible services. A SIM card gives you access to a mobile network too. Android phones have a slot on the side (a SIM tray) for inserting a SIM card. To insert a SIM card into the SIM tray:

- 1 The SIM tray is located on the side of the phone, with a small hole at the end of it



- 2 Use the SIM tool (which should be provided with the phone) to open the SIM tray, by pressing firmly into the hole shown in Step 1



- 3 Pull out the SIM tray and remove it fully from the phone



- 4 Insert the SIM card into the SIM tray and return it into the slot in the phone. (Some SIM trays have compartments for different sizes of SIM cards)



Setting Up Your Phone

When you first turn on your phone (by pressing and holding the **On/Off** button), you will be taken through the setup process. This only has to be done once, and some of the steps can be completed or amended at a later time, usually within the **Settings** app. Some of the elements that can be applied during the setup process include:

- **Language.** This option lets you select the language to use for your phone. Whichever language is selected will affect all of the system text on the phone, and it will also apply to all user accounts on the phone.
- **Wi-Fi.** This can be used to set up your Wi-Fi so that you can access web and online services. In the **Select Wi-Fi** window, tap on the name of your router. Enter the password for your router and tap on the **Connect** button.
- **Google Account.** At this stage, you can create a Google Account or sign in with an existing one. Once you have done this, you will have full access to Google Account services and you will not have to enter your login details again. (A Google Account can also be set up at a later time; see pages 22-23.)
- **Google services.** This includes options for which of the Google services you want to use, including backing up your phone, using location services, and sending feedback to Google.
- **Date and time.** This can be used to set the date and time, either manually or automatically.
- **Method of screen lock.** This can be used to set a lock for the phone, using a fingerprint, a PIN code, a pattern, a password, or face recognition.
- **Screen layout.** This can be used to create a larger interface on the phone's screen, by changing the size of items on it and the font size.



Most routers require a password when they are accessed for the first time by a new device. This is a security measure to ensure that other people cannot gain unauthorized access to your router and Wi-Fi.



Wi-Fi has to be connected in order for a Google Account to be created or signed in to during the setting up of the phone.



Since Android is owned by Google, much of its functionality is provided through a Google Account.



If you already have a Gmail Account, this will also serve as your Google Account, and the login details (email address and password) can be used for both.

Android and Google

Most phones are linked to specific companies for the provision of their services and selection of apps: Apple for the iPhone and Google for phones using Android, as well as the phone's manufacturer (e.g. Samsung). As with other phones, for Android phones you must have a linked account to get the most out of your phone. This is a Google Account and is created free of charge with a Google email address (Gmail) and a password. Once it has been created, your Google Account will give you access to a number of pre-installed Android apps and also additional services such as backing up and storing your content online.

When you first set up your phone, you can enter your Google Account details or select to create a new account. You can also do this at any time by accessing one of the apps that requires access to a Google Account. These include:

- **Play Store**, for obtaining more apps.
- **Google TV**, for obtaining movies and TV shows.
- **Play Books**, for obtaining books.
- **Google News**, for displaying news stories.

When you access one of these apps you will be prompted to create a Google Account. You do not have to do so at this point, but it will give you access to the full range of Google Account services.

Other apps such as the **Photos** app for storing and viewing photos can be used on their own, but if a Google Account has been set up, the content can be backed up automatically.



When you buy anything through your Google Account, such as music, apps or movies, you will have to enter your credit or debit card details (unless you are downloading a free app), which will be used for future purchases through your Google Account.

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Some of the benefits of a Google Account include:

- Access from any computer or mobile device with web access, from the **accounts.google.com/** page. Once you have entered your account details you can access online Google services, including Calendar, Gmail, and the Play Store.
- Keep your content synchronized and backed up. With a Google Account, all of your linked data will be automatically synchronized so that it is available for all web-enabled devices, and it will also be backed up by Google's own computers (servers). Some items can also be backed up manually rather than automatically.



- Peace of mind that your content is protected. There is a **Security** section on your Google Account web page where you can apply various security settings and alerts.



If you buy items from the Play Store through your Google Account on the web, they will also be available on your Android phone.



A new Google Account can also be created within **Settings > Passwords & accounts** on your phone. Tap on the **Add account** button and tap on the **Google** button. Then, enter the required details for the new Google Account (see pages 22-23).

Creating a Google Account

A new Google Account can be created in the following different ways:

- During the initial setup of your Android phone.
- When you first access one of the relevant apps, as explained on page 20.
- From the **Settings** app, by selecting **Passwords & accounts > Add account**.

For each of the above, the process for creating a Google Account is the same.



During the account setup process there is also a screen for account recovery, where you can add an answer to a question so that your account details can be retrieved by Google if you forget them.

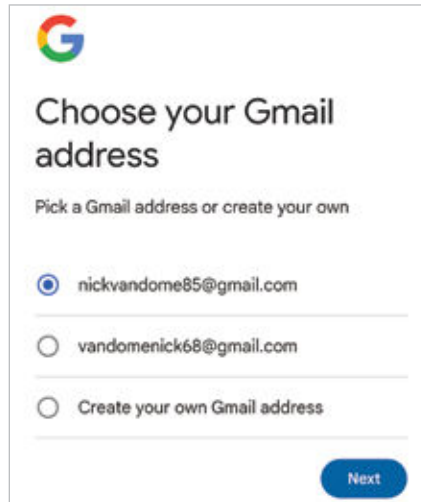
- 1 If you already have an account, enter your sign-in details, or tap on the **Create account** option

- 2 Enter the first and last name for the new account user, then tap on the **Next** button

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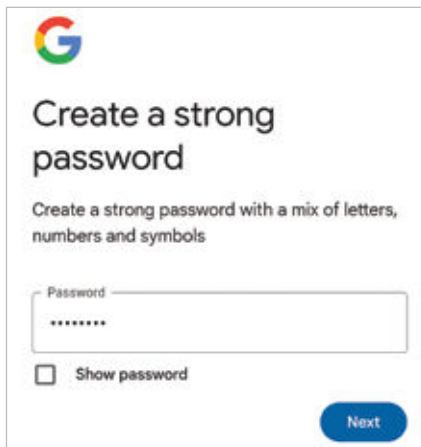
Enter a username (this will also become your Gmail address), then tap on the **Next** button at the bottom of the screen



A username for a Google Account is a unique name created by the user, which is suffixed by *@gmail.com*.

4

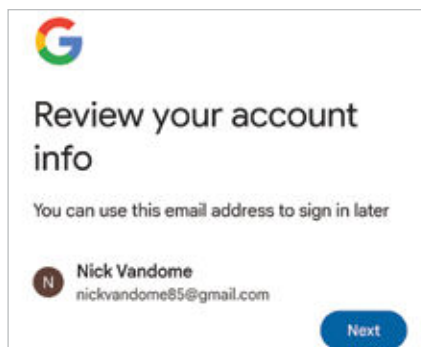
Create a password for the account and then re-enter it for confirmation. Tap on the **Next** button at the bottom of the screen



If your chosen username has already been taken, you will be prompted to amend it. This can usually be done by adding a sequence of numbers to the end of it, but make sure you remember the sequence correctly.

5

The account details are displayed. Tap on the **Next** button to sign in with your new account





If you are using your phone in an area where there is likely to be moisture, such as in the kitchen if you are following a recipe, cover the touchscreen in some form of light plastic wrap to protect it from any spills or splashes.

Using a Touchscreen

The traditional method of interacting with a computer is by using a mouse and a keyboard as the input devices. However, this all changed with smartphones; they are much more tactile devices that are controlled by tapping and swiping on the touchscreen. This activates and controls the apps and settings on the phone, and enables you to add content with the virtual keyboard that appears at appropriate times.

Gently does it

Touchscreens are sensitive devices and only require a light touch to activate the required command. To get the best out of your touchscreen:

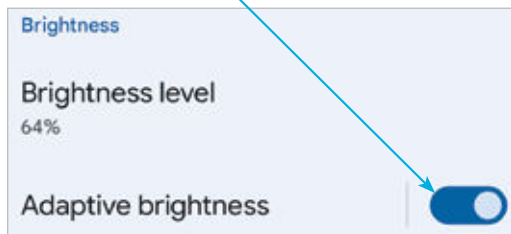
- Tap, swipe or press gently on the screen. Do not use excessive force and do not keep tapping with increasing pressure if something does not work in the way in which you expected. Instead, try performing another action and then returning to the original one.
- Tap with your fingertip rather than your fingernail. This will be more effective in terms of performing the required operation and is better for the surface of the touchscreen.
- For the majority of touchscreen tasks, tap, press or swipe at one point on the screen. The exception to this is zooming in and out on certain items (such as web pages), which can be done by swiping outward and pinching inward with thumb and forefinger.
- Keep your touchscreen dry, and make sure that your fingers are also clean and free of moisture.
- Use a cover to protect the screen when not in use, particularly if you are carrying your phone in a jacket pocket or a bag.
- Use a screen cloth to keep the screen clean and free of fingerprints and smears. The touchscreen should still work if it has fingerprints and marks on it, but it will become harder to see clearly what is on the screen.

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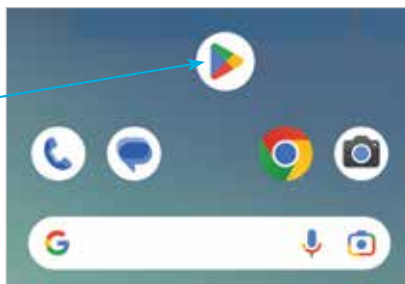
Touchscreen controls

Touchscreens can be controlled with three main types of actions. These are:

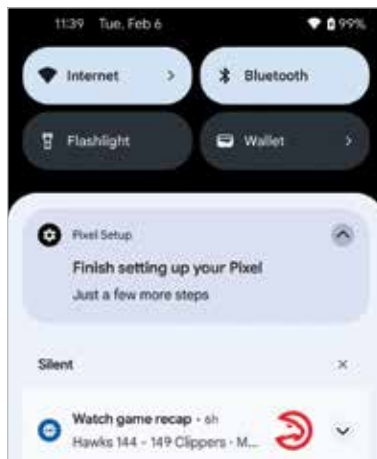
- **Tapping.** Tap once on an item such as an app to activate it. This can also be used for the main navigation control buttons at the bottom of the touchscreen or for items such as **On/Off** buttons when applying settings for specific items.



- **Pressing.** Press and hold on an item on the Home screen to move its position or place it in the **Favorites Tray** at the bottom of the screen.



- **Swiping.** Swipe down from the top of the Home screen to access the **Notifications panel** and the **Quick Settings**, and swipe left and right to view all available Home screens or to scroll through photo albums.



For more information about working with apps on the Home screen and the Notifications panel, see Chapter 3.



If your phone is running low on memory it will automatically close any open apps to free up more memory. The ones that have been inactive for the longest period of time are closed first.

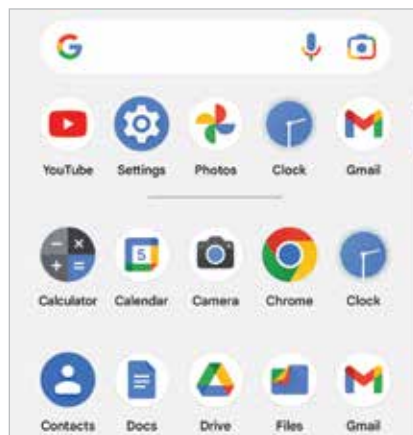


New apps for Android phones are available through the Play Store or directly from the developer's website. They can be downloaded from there and will then appear on your phone. (See pages 122-123.)



Using Apps


One of the great selling points for Android phones is the range of apps that are available for them. At the time of printing, there are at least 3.4 million Android apps in the Google Play Store, with others available from third-party developers. Some are free, while others are paid for.



The pre-installed apps are the ones that give the initial functionality to your phone, and include items such as email, a web browser, a calendar a calculator and maps. They appear as icons on your phone's Home screen or in the **All Apps** area (see page 46) and are accessed by tapping on them once.

Managing apps

When you switch from one app to another, you do not have to close down the original one that you were using. Android keeps it running in the background, but in a state of hibernation so that it is not using up any memory or processing power on your phone. To do this:

- 1 Tap on an app to open it and move through its screens as required. Swipe up from the bottom of the screen to return to the Home screen (or tap on the **Home** button on the phone's Navigation bar at the bottom of the screen, if this is the method of navigation being used – see page 45). The app will remain open in the background 
- 2 Tap on the app again. It will open up at the point at which you left it