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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. It also looks at creating a Google Account for use on your Android smartphone.

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

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 leads 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 it 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**. Rather than just one Desktop, you can create 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 runs the latest version of Android (at the time of printing, Android 7 Nougat) while some models of older phones may still only be able to run Android 4.3 Jelly Bean. 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 the same on different Android phones. However, one area of difference is the hardware used by manufacturers. For instance, some newer Android phones have fingerprint sensors for unlocking the phone, and others have more sophisticated cameras.

Updated versions of Android are named alphabetically after items of confectionery.

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. It will feature Android version 6.0 Marshmallow, which is the version of Android most widely adopted on Android phones (at the time of printing). The examples will also be from a Samsung phone, the most widely used brand of smartphone on the market.

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.

Since 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, 7.0 Nougat, while others are still running previous versions, such as 4.3 Jelly Bean, 4.4 KitKat. 5.0 Lollipop or 6.0 Marshmallow. 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. This can be because of hardware limitations, but there have also been suggestions that it is a move by hardware manufacturers designed to ensure that consumers upgrade to the latest products.

The version of the Android operating system that is being used on your phone can be viewed from within the **About device** section of the **Settings** app. This is where the operating system can also be updated when a new version is available.

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

For more details about the Android settings, see Chapter Three.

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 a 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 own Android, they use the operating system in its purest form on their phones.

Features of Android 7.0

The latest version of Android (at the time of printing) is Android 7.0 Nougat, which is only available on a limited number of Android phones. However, much of its functionality is the same as the more widely used version of Android, 6.0 Marshmallow, although there are some enhancements, particularly for notifications:

Quick Switch

Double-tap on the **Recent Items** button to toggle between the two most recently used apps. This is known as **Quick Switch**. Each app is shown full-screen when the button is double-tapped.

Grouped notifications

In Android 7.0 Nougat, notifications from apps are grouped together, so that you can view similar notifications at the same point in the Notification panel and action them accordingly.

> **M** Gmail • nickvandome@googlemail.com • now ∨
>
> Nick Vandome Can we postpone, it's raining!
>
> Nick Vandome It's okay, the sun is out!
>
> Nick Vandome Cancel that, it's snowing!
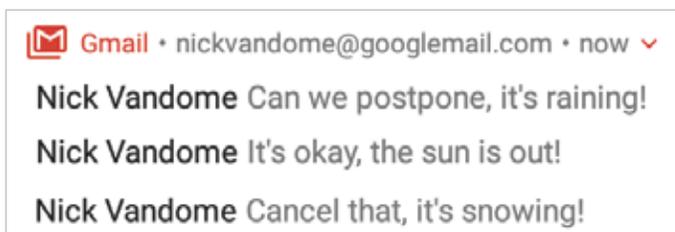
Replying to notifications

Also, for some apps such as those for messaging, it is possible to reply directly to a notification without opening the specific app.

> **S** Skype • ∧
>
> Eilidh Vandome
> Hi, how are you?
>
> REPLY TO EILIDH VANDOME

Don't forget

Android 7.0 Nougat also has enhanced multi-tasking, for using two or more windows at the same time.
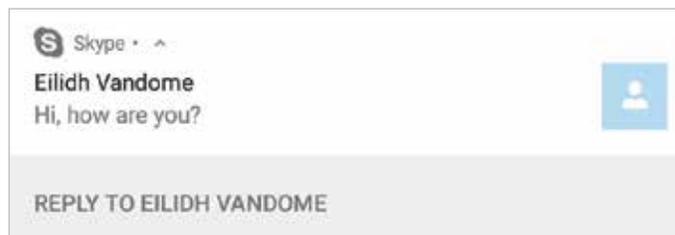
Notifications quick settings

In Android 7.0 Nougat it is possible to apply quick notifications settings to an app directly from the Notification panel, so that you can manage how specific apps use notifications without having to go into the Settings app. To do this:

1 Press and hold on a notification in the Notification panel

Google Play Store · 4d ⌄

28 applications updated

AVG AntiVirus FREE for Android, Maps - Navigation & Transit,
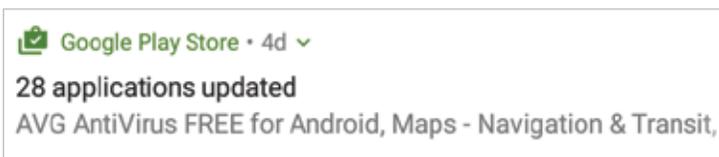
2 Tap on one of the options for how you want notifications from the app to operate

Google Play Store

○ Show notifications silently

○ Block all notifications

◉ Don't silence or block
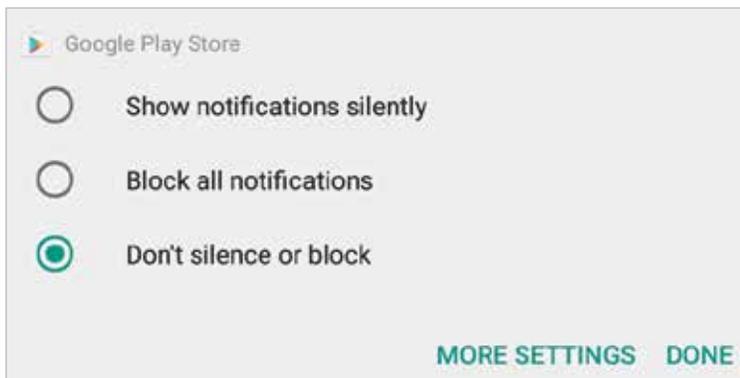
MORE SETTINGS   DONE

3 Tap on the **Done** button to apply the selection in Step 2, or tap on the **More Settings** button to access the notification options in the Settings app

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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.

On the Power off screen there are also options for **Airplane mode**, which turns off all network communications on the phone, and **Restart**, to turn off the phone and then turn it back on again. This can be used if the phone freezes and cannot be used normally.

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.
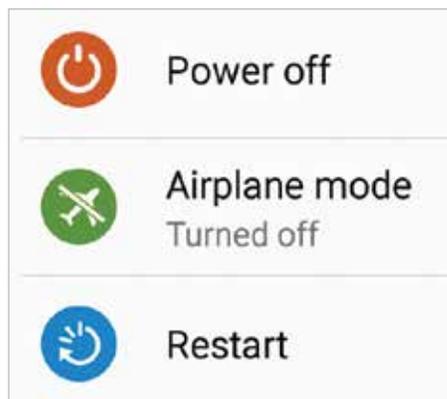
Volume button. This is usually a single button on the opposite side to the On/Off button. Press at either end to increase or decrease volume.

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", 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.

Don't forget

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

Hot tip

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.

SIM Cards

The SIM card for your Android phone will be provided by your mobile carrier, i.e. the company which 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. Some phones have a slot on the side (a SIM tray) for inserting a SIM card, while others have a slot in the back of the phone. To insert a SIM card into the latter:

1 Remove the back panel of the phone

2 The SIM tray is often positioned next to the battery. The battery has to be removed to gain access to the SIM tray

3 Place the SIM card into the SIM tray – line up the notch on the SIM card with the icon next to the SIM tray, so that the gold contacts are facing down and aligned with those on the phone – and push it firmly into place

4 Replace the battery, and the back panel of the phone

5 If the SIM is working properly, this symbol should appear on the top toolbar on the phone's screen, after you turn it on

SIM cards usually use 3G or 4G networks for providing cellular phone and data services, e.g. texting and messaging. 4G is faster, but 3G is more widely available.

Some Android phones, particularly newer models, have the SIM tray located around the body of the phone. The tray can be removed to insert the SIM card (a special key is needed for this, provided with the phone). If the SIM tray is accessed in this way, it is common for the battery to be non-removable.

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 are:

- **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 the 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 the 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 20-21.)

- **Apps & data**. This option can be used to set up your new phone from a backup that you have made on another device. This will include all of the apps and settings that you have on the other device. You can also set up your phone as a new device.

- **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.

- **Google Feeds**. This is the personal digital information and news feed that can be used to display a range of cards with the information that is most important to you (see pages 74-78).

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.

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

Android and Google

Most phones are linked to specific companies for the provision of their services and selection of apps: Apple for the iPhone, Microsoft for the Windows Phones, and Google for phones using Android, as well as the phone's manufacturer (e.g. Samsung). As with the 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 the built-in 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.

- **Play Movies & TV**, for obtaining movies and TV shows.

- **Play Books**, for obtaining books.

- **Play Newsstand**, 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 will be backed up automatically.

Don't forget

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.

**Don't forget**
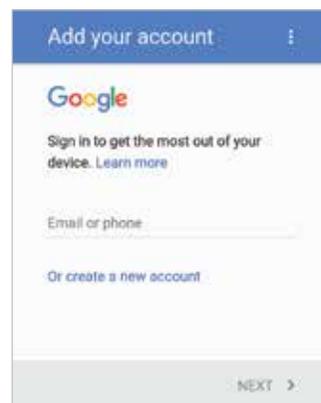
When you buy anything through your Google Account, such as music, apps or movies, you will have to enter your credit or debit card details (unless you are downloading a free app), which will be used for future purchases through your Google Account.

Add your account

Google

Sign in to get the most out of your device. Learn more

Email or phone

Or create a new account

NEXT >

Some of the benefits of a Google Account include:

- Access from any computer or mobile device with web access, from the page **accounts.google.com/** Once you have entered your account details you can access the online Google services, including your 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 the Google servers if you have set this up in Google Drive (see page 43).

If you buy items from the Play Store through your Google Account on the web, they will also be available on your Android phone.
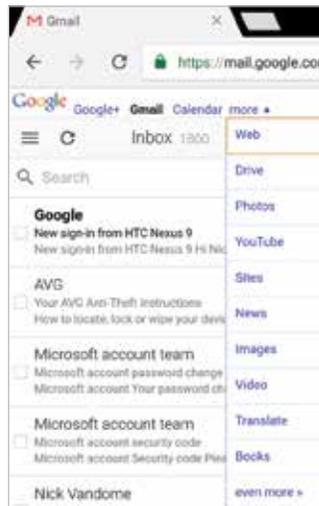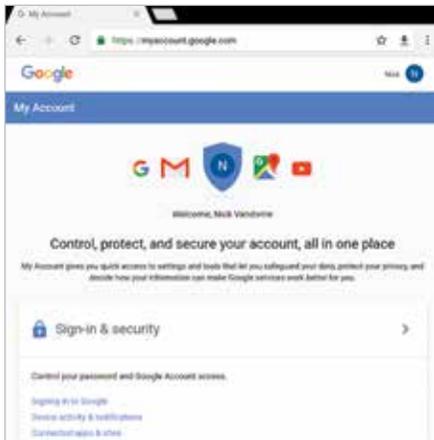
- Peace of mind that your content is protected. There is a **Security** section on your Google Account web page where you can apply various security settings and alerts.

A new Google Account can also be created within **Settings** > **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 20-21).

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 18.

- From the **Settings** app, by selecting the **Accounts > Add an account** option.

For each of the above, the process for creating the 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 On the **Add your account** screen, tap on the **Or create a new account** option

Add your account

Google

Sign in to get the most out of your device. Learn more

Email or phone

Or create a new account
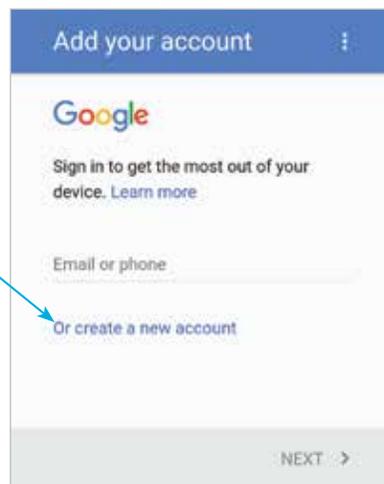
NEXT >

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

Create a Google Account

First name
Nick

Last name
Vandome
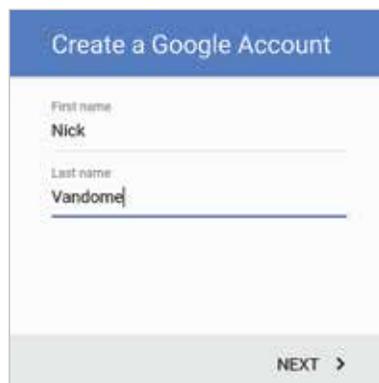
NEXT >

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

How you'll sign in

You'll use this username to sign in to your Google Account

Username
nickvandome30   @gmail.com

Only use A-Z, a-z, and 0-9
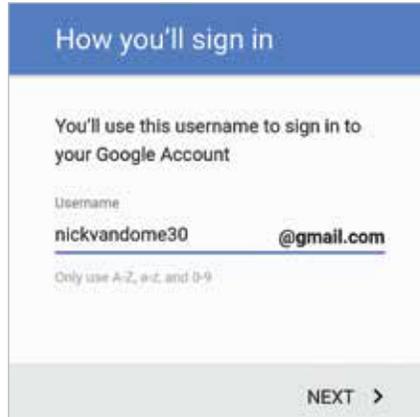
NEXT >

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

Create password

Create a strong password with a mix of letters, numbers and symbols

Create password
••••••••

At least 8 characters   Strong

Confirm password
••••••

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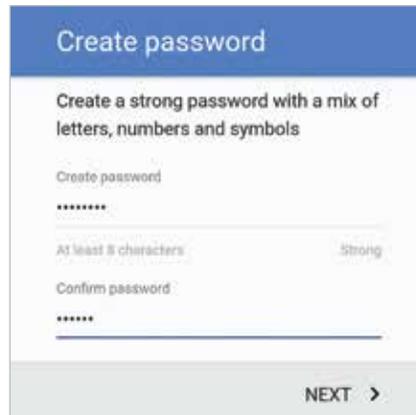
If your chosen username has already been taken, you will be prompted to amend it. This can usually be done by adding a sequence of numbers to the end of it, but make sure you remember the sequence correctly.

5 On the **Your Google Account** page, tap on the **Next** button to sign in with your new account

Your Google Account

Email
nickvandome30@gmail.com

Password
••••••••

Your Google Account comes with access to everything Google: apps, music, games, and more

NEXT >

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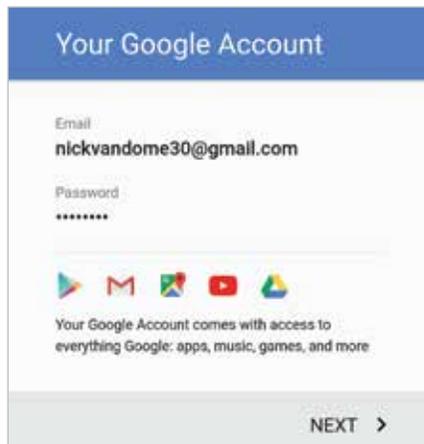
If you are using your phone in an area where there is likely to be moisture, such as in the kitchen if you are following a recipe, cover the touchscreen in some form of light plastic wrap to protect it from any spills or splashes.

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 has 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 the 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 outwards and pinching inwards 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.

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 checkboxes when applying settings for specific items.

Auto adjust screen tone
Adjust the display brightness based on the on-screen image to save power.
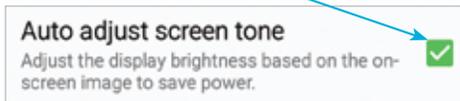
- **Pressing**. Press and hold on an item on the Home screen to move its position or place it in the **Favorites Tray** at the bottom of the screen.
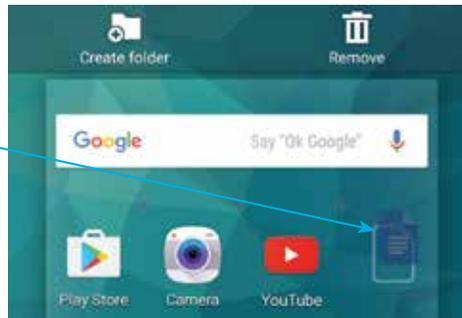
- **Swiping**. Swipe down from the top of the Home screen to access the **Notification panel** and the **Quick Settings**, and swipe left and right to view all of the available Home screens, or to scroll through photo albums.
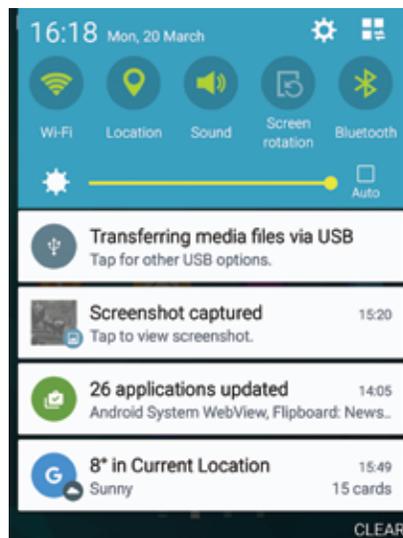

For more information about working with apps on the Home screen and the Notification panel see Chapter Four. For details about Quick Settings, see pages 45-46.

23
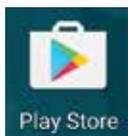
Using Apps

One of the great selling points for Android phones is the range of apps that are available from third-party developers. At the time of writing there are at least 2.8 million Android apps on the market. Some are free, while others are paid for.

The built-in apps are the ones that give the initial functionality to your phone, and include items such as email, web browser, calendar, calculator and maps. They appear as icons on your phone's Home screen, or in the All Apps area (see page 52), and are accessed by tapping lightly on them once.

24

Play Store

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. Tap on the **Home** button on the phone's Navigation bar at the bottom of the screen to return to the Home screen at any point. 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

You can also move back to the Home screen by tapping on the **Back** button. This takes you back through the screens that you have accessed within the app, until you reach the app's Home screen, at which point the next screen back will be the phone's Home screen.