Android
4 Great Accessibility Features for People with Vision Impairments

This document has been designed to introduce you to some of the most useful Accessibility features found in the Android operating system, designed to help people with vision impairments.

Note 1: the instructions given in this document have been created using a Samsung Galaxy S21 Smartphone, running Android version 15. If you are using a non-Samsung device or an earlier version of Android, you might find some minor differences. However, it isn't anticipated that you will!

1.   The Colour Inversion Feature

Do you struggle with glare when reading text on your Android device (Smartphone or Tablet)? Or do you just find black text on a white background to be difficult to read? Well, if the answer to either of these questions is "Yes", then you might benefit from the Colour Inversion feature!

What is Colour Inversion?

Colour Inversion is an Accessibility feature that is built-in to all Android Smart Phones and Tablets.   It is designed to make viewing the contents of the screen a little easier in certain light conditions by reversing the foreground and background colours.

Turning on Colour Inversion

To turn on Colour Inversion on your Android device, follow these suggested steps:

Note 2: It is possible to turn Colour Inversion on and off using an Accessibility Shortcut that involves pressing the Side and Volume Up buttons together on your device.   However, this feature is not enabled by default.   Instructions for enabling the Accessibility Shortcut are given later in this document.

1.   From the Home Screen, activate the Apps icon.   This is usually situated at the bottom centre of the screen. Upon doing this, the Apps screen will be displayed.

Note 3: An alternative method of displaying the App Screen, is to perform a **One Finger Swipe Up** from the bottom of the screen.

2.   In the Apps screen, locate and activate the Settings icon. Visually, this looks like a cog-wheel.   Upon doing this, the Settings screen will be displayed.

3.   In the Settings screen, locate and activate the Accessibility button. This button also contains the text "Vision, Hearing, Dexterity". Upon doing this, the Accessibility screen will be displayed.

4.   In the Accessibility screen, locate and activate the "Vision Enhancements" button.   Upon doing this, the Vision Enhancements screen will be displayed.

5.   In the Vision Enhancements screen, locate the Colour Inversion button.   To the right of this button, you will find a virtual switch at the right of the screen, which indicates whether or not Colour Inversion is On/Off.

6.   Activate the Virtual switch to toggle the switch to the "on" setting. You should now find that the background colour is black and the text colour is white!

7.   Now, activate the "Back" button, to return to the Accessibility screen.

8.   Activate the "back" button again to return to the Settings screen.

9.   Finally, activate the **Home** button, situated at the bottom centre of the screen.   Upon doing this, you will be returned to the Home Screen of your device.

Note 4: With Colour Inversion turned on ,you may find that the colour of your Home Screen is very different.   This is because the colour you were using has been reversed to display the exact opposite of the original colour! Also, photographs will appear as negatives!

Turning Off Colour Inversion

There are two common ways of turning Colour Inversion off.   For completeness, both methods are outlined below:

Method 1 - Via the Settings App

To turn Colour Inversion off via the Settings app, follow these suggested steps:

1.   From the Home Screen, activate the Apps icon.   This is usually situated at the bottom centre of the screen. Upon doing this, the Apps screen will be displayed.

2.   In the Apps screen, locate and activate the Settings icon. Visually, this looks like a cog-wheel.   Upon doing this, the Settings screen will be displayed.

3.   In the Settings screen, locate and activate the Accessibility button. This button also contains the text "Vision, Hearing, Dexterity". Upon doing this, the Accessibility screen will be displayed.

4.   In the Accessibility screen, locate and activate the "Vision Enhancements" button.   Upon doing this, the Vision Enhancements screen will be displayed.

5.   In the Vision Enhancements screen, locate the Colour Inversion button.   To the right of this button, you will find a virtual switch at the right of the screen, which indicates whether or not Colour Inversion is On/Off.

6.   Activate the Virtual switch to toggle the switch to the "off" setting. You should now find that the background colour is white and the text colour is black!

7.   Now, activate the "Back" button, situated at the top left corner of the screen. Upon doing this, you will return to the Accessibility screen.

8.   Activate the "back" button again. Upon doing this, you will return to the Settings screen.

9.   Finally, activate the **Home** button, situated at the bottom centre of the screen.   Upon doing this, you will be returned to the Home Screen of your device.

Method 2 - Using an Accessibility Shortcut

An Accessibility Shortcut allows you to turn one or more Accessibility features on/off by pressing the Side and Volume Up buttons on the edge of your device together.

To enable the Accessibility Shortcut for Colour Inversion, follow these suggested steps:

1.   Locate and activate the Settings icon.   Upon doing this, the Settings screen will be displayed.

2.   In the Settings screen, locate and activate the Accessibility button. Upon doing this, the Accessibility screen will be displayed.

3.   In the Accessibility screen, locate and activate the Advanced Settings button.   Upon doing this, the Advanced Settings screen will be displayed.

4.   In the Advanced Settings screen, locate and activate the Side and Volume Up keys button.   Upon doing this, The Side and Volume Up keys screen will be displayed.

In the Side and Volume Up keys screen, you will find a number of Accessibility features which can be activated by pressing the Side and Volume Up keys together.

5.   Locate and activate the Colour Inversion button.   Upon doing this, a virtual On switch will be displayed to the left of the button. For reference, in standard colours, it will be blue!

6.   Now, activate the "Back" button, situated at the top left corner of the screen. Upon doing this, you will return to the Accessibility screen.

7.   Activate the "back" button again. Upon doing this, you will return to the Settings screen.

8.   Finally, activate the **Home** button, situated at the bottom centre of the screen.   Upon doing this, you will be returned to the Home Screen of your device.

Now you have enabled the Accessibility Shortcut, you can press the Side and Volume Up buttons together to turn Colour Inversion on/off.

Note 5: It is possible to assign more than one Accessibility feature to be turned on or off using the Side and Volume Up buttons.   If you have 2 or more features enabled, a popup window will be displayed prompting you to choose the desired option.   Activate the appropriate button to turn the desired feature on/off!

2.   The Font Size Feature

The font size feature, allows you to increase the size of the text inside apps which support dynamic type. For reference, these include: Contacts, Messages, Phone, Settings and WhatsApp.

To increase the Font size, follow these steps:

1.   From the Home Screen, activate the "Settings" icon. Upon doing this, the Settings screen will be displayed.

2.   In the Settings screen, activate the "Accessibility" button. Upon doing this, the Accessibility screen will be displayed.

3.	In the Accessibility screen, activate the "Vision Enhancements" button. Upon doing this, the Vision Enhancements screen will be displayed.

4.	In the Vision Enhancements screen, activate the "Font Size and Style" button. Upon doing this, the Font Size and Style screen will be displayed.

In the Font Size and Style screen, you will find a slider bar at the bottom of the screen for adjusting the size of the text. To the left of this slider, you find a button, decreasing the size incrementally by 10%. This button is labelled with a small capital A. To the right of the slider, you will find another button, for increasing the text size incrementally by 10%. This button is labelled with a large capital A.

5.	Using the slider bar at the bottom of the screen, or the available buttons, adjust the text size. As you do this, the text on the screen will change to the setting you specify.

6.	When you have specified your preferred text size, activate the "Back" button, situated at the top left corner of the screen to return to the Vision Enhancements screen.

7.	Activate the "Back" button again to return to the Settings screen.

8.	Finally, press the Home button to close the Settings app and return focus to the Home Screen.

Now, when you use an app which supports dynamic type, such as Messages or WhatsApp, the text will adjust to the size you specified in the Font Size and Style screen.

Note 6: Changing the font size doesn't affect the size of the text underneath the icons on the Home Screen. This can only be done using magnification (discussed next).

3.   The Magnification Feature

The Magnification feature can be toggled on/off in three different ways. Each method has its advantages, but the easiest method is to use the Magnification shortcut. This involves performing a One Finger Triple Tap on the screen. However, before you can do this, you first need to turn the shortcut on.

Specifying the Magnification Shortcut

To specify the Magnification shortcut, follow these steps:

1.   From the Home Screen, activate the "Settings" icon. Upon doing this, the Settings screen will be displayed.

2.   In the Settings screen, activate the "Accessibility" button. Upon doing this, the Accessibility screen will be displayed.

3.   In the Accessibility screen, activate the "Vision Enhancements" button. Upon doing this, the Vision Enhancements screen will be displayed.

4.   In the Vision Enhancements screen, activate the "Magnification" button. Upon doing this, the Magnification screen will be displayed.

5.   In the Magnification screen, activate the "Magnification shortcut" button. For reference, this button will also include the name of the current method of turning magnification on/off. Upon doing this, the Magnification Shortcut screen will be displayed.

In the Magnification Shortcut screen, you will find three tick boxes, each associated with a particular method of turning magnification on/off.

6.   Towards the top of the screen, you will find a label which reads "Magnification shortcut". To the right of this, you will find a button, which is used to turn the shortcut on/off. Activate the button to turn the Magnification Shortcut on.

7.   Now, activate the tick box associated with the "Triple tap screen" option.

8.   Finally, activate the "Back" button, situated at the top left corner of the screen. Upon doing this, you will return to the Magnification screen.

That's it, you have successfully specified the Magnification Shortcut for turning magnification on/off.

Specifying the Magnification Type

When Magnification is turned on, the screen can be magnified in a number of different ways. For example, magnification can be applied to a specific part of the screen, a particular window, or the entire screen.

To specify the preferred Magnification type, follow these steps:

1.   In the Magnification screen, activate the "Magnification Type" button. For reference, this button contains the name of the current magnification type. Upon doing this, the Magnification Type screen will be displayed.

The Magnification Type screen contains three radio buttons, each associated with a specific magnification type. These include Partial Magnification, where only a small area of the screen will be magnified and Full Screen, whereby the whole screen will be magnified.

2.   Activate the button associated with your desired Magnification Type (Full Screen recommended). For most people, Full Screen is the best setting!

3.   When you have specified your preferred Magnification Type, activate the "Back" button, situated at the top left corner of the screen.   Upon doing this, you will return to the Magnification screen.

That's it, you are now all set to use magnification.

Using Magnification

To turn magnification on, perform a One Finger Triple Tap, anywhere on the screen. When you do this, it might not be apparent that the magnification feature has been enabled. You will be able to tell however, as a blue border will surround the magnified area.

Note 7: The time between the taps must be less than half a second. This is a tricky gesture to master, so be patient!

To increase the magnification level, perform the Pinch Open gesture. This involves placing your thumb and your first finger together on the screen, then sliding your first finger away from your thumb. This is known as zooming in.

To decrease the magnification level, perform the Pinch Close gesture. This involves placing your thumb and first finger on the screen, reasonably wide apart, then sliding your first finger back towards your thumb. This is known as zooming out.

Scrolling the Screen

One consequence of using magnification, is that you won't be able to see the entire contents of the screen. The higher the magnification level, the less you will be able to see at any given time.

In order to see all of the screen contents, you will have to scroll the screen to the left and right as well as up and down. To scroll the screen, place Two Fingers on the screen and slide them left, right, Up and Down to scroll.

When you have finished with magnification, perform a One Finger Triple Tap. When you do this, Android remembers the magnification level you were last using and will use this when you turn magnification back on.

4.   The TalkBack Feature

What is TalkBack?

TalkBack is a screen reader. It enables a person with a vision impairment to find out what is on the screen of their Smartphone or Tablet by reading out what's under their finger. It also reads alerts and popup messages when they appear!

TalkBack Gestures

If you didn't need TalkBack, you could simply look at the screen and tap the feature you want. However, using TalkBack requires constant contact with the screen, so the techniques used by sighted people won't work. TalkBack uses a series of 'gestures' to accomplish the same things. Gestures are made by moving one or more fingers around the screen, or by tapping with one or more fingers.

Turning on TalkBack

There are a few ways to turn Talk back on. The two easiest methods are described below:

Using Gemini to Turn TalkBack On

If you have Google Gemini enabled on your Smartphone, this is by far the easiest way of turning TalkBack on. Simply say "OK Google, turn

TalkBack on". Upon doing this, Gemini will say "turning TalkBack on". For reference, to turn TalkBack off, simply say "OK Google, turn Talkback off"!

Turning TalkBack on Using an Accessibility Shortcut

If you don't have the Google Assistant available, you can use an Accessibility Shortcut to turn TalkBack on instead. An Accessibility Shortcut involves pressing a combination of the Power, Volume Up or Volume Down keys together.

It is possible to turn TalkBack on and off by holding down the Power button and the Volume Up button at the same time. However, this feature is not enabled by default. Therefore, sighted assistance may be required in order to turn TalkBack on for the first time using this method.

To turn TalkBack on using the Power and Volume Up keys, follow these suggested steps:

1.   From the Home Screen, activate the "Settings" icon. For reference, this icon has an associated graphic of a cog-wheel. Upon doing this, the Settings screen will be displayed.

Note 8: If you do not have a Settings icon on your Home Screen, activate the Apps button and then locate and activate the Settings app in the resulting screen.

2.   In the Settings screen, locate and activate the "Accessibility" button. For reference, this button also contains the text "Vision, Hearing, Dexterity". Upon doing this, the Accessibility screen will be displayed.

3.   In the Accessibility screen, locate and activate the "Advanced Settings" button. Upon doing this, the Advanced Settings screen will be displayed.

4.   In the Advanced Settings screen, locate and activate the "Side and Volume Up keys" button. Upon doing this, the Side and Volume Up screen will be displayed.

5.   In the Side and Volume Up screen, ensure that only the tick box associated with TalkBack is ticked. Upon doing this, a screen will be displayed which describes how TalkBack can take full control of your phone and provide help in navigating and reading text based information, as well as when navigating inside apps.

6.   At the bottom of the screen, you will find two buttons, labelled Deny and Allow. Activate the "Allow" button. Upon doing this, TalkBack will be turned on and you will hear a spoken announcement to confirm this!

7.   Finally, activate the **Home** button, situated at the bottom centre of the screen. Note that in order to activate the button, you must first touch it, then perform a One Finger Double Tap anywhere on the screen (more about this later). Upon doing this, you will be returned to the Home Screen.

Now you have enabled the Accessibility Shortcut, you can press the Power and Volume Up keys together to turn TalkBack off. To turn TalkBack back on again, simply press the Power and Volume Up keys together again!

Note 9: It's possible to assign more than one Accessibility feature to be turned on or off using an Accessibility Shortcut. If you have 2 or more features enabled, a popup window will be displayed prompting you to choose the desired option. Activate the appropriate button to turn the desired feature on/off.

TalkBack Gestures

TalkBack uses a series of finger movements, called "gestures", to navigate the screen and activate controls. There are many types of gesture. Some gestures use just one finger, whilst others involve the use of two, three and sometimes 4 fingers. Gestures can be a little tricky to learn, but with practice and determination, you will find that you can access information with relative ease!

Navigating Screens with TalkBack

With TalkBack turned on, you can navigate the screen in two ways. The first method involves simply placing one finger on the screen and dragging it around. In doing this, whichever item your finger passes over, TalkBack will announce it. The last thing spoken by TalkBack is considered to be the Current Item.

The second method of navigation is to use the One Finger Swipe Right gesture. This gesture involves swiping one finger across the screen, a little like flicking an imaginary fly that had landed on the screen off! Upon swiping to the right, the next item will be selected and spoken by TalkBack. This item will become the current item. For reference, swiping to the left with one finger results in the previous item being selected and becoming the current item.

Note 10: TalkBack uses a cursor to navigate. This is represented by a thick border surrounding the currently selected item. Whatever is inside the border will be spoken by TalkBack!

Following are the most commonly used TalkBack gestures.

One Finger Drag
This is known as the Explore gesture. It allows you to explore the contents of the screen. When your finger passes over an item, it is spoken by TalkBack.

One Finger Swipe Right
This is known as the Next Item gesture. It moves the TalkBack cursor to the next item and reads it. For reference, items include icons, blocks of text, buttons and text fields inside apps.

One Finger Swipe Left
This is known as the Previous Item gesture. It moves the TalkBack cursor to the previous item and reads it. For reference, items include icons, blocks of text, buttons and text fields inside apps.

One Finger Double Tap
This is known as the Activate gesture. It is used to activate the Current Item. For reference, items include icons, blocks of text, buttons and text fields inside apps.

After touching the item you want to activate, you can perform the One Finger Double Tap anywhere on the screen, as the last item you touched is considered to be the Current Item!

Note 11: Buttons can have two purposes. The first is to display a new screen of information. The second is to turn a setting on or off. In either case, you activate it in the same way, by performing a One Finger Double Tap!

Note 12: When performing the One Finger Double Tap gesture, the taps need to be immediately after each other. You cannot delay, because if you do, TalkBack will interpret this as two separate Explore gestures!

Two Finger Swipe Left
This is known as the Scroll Right gesture. It is used on the **Home Screen** to display the next page. Upon doing this, TalkBack will announce "page X of Y", where X is the current page and Y is the total number of pages available.

Two Finger Swipe Right
This is known as the Scroll Left gesture. It is used on the **Home Screen** to display the previous page. Upon doing this, TalkBack will announce "page X of Y", where X is the current page and Y is the total number of pages available.

Two Finger Swipe Up
This is known as the Scroll Down gesture. It is used inside apps to scroll the screen down. Place two fingers on the screen, and slowly slide your fingers up the screen. Upon doing this, you will hear a tone and the next few options will come into view! You can now use the Explore Gesture, or the Next Item gesture, to explore the items.

Two Finger Swipe Down
This is known as the Scroll Up gesture. It is used inside apps to scroll the screen up. Place two fingers on the screen and slowly slide your

fingers down the screen. Upon doing this, you will hear a tone and the previous few options will come into view! You can now use the Explore Gesture, or the Next Item gesture, to explore the items.

Note 13: When performing gestures that involve two or more fingers, leave a small gap between the fingers. This will help TalkBack to recognise how many fingers are touching the screen!
There are a few more gestures you can use to navigate screens with TalkBack. However, the gestures provided above should be sufficient to get you going!

Adjusting the TalkBack Speech Rate

You can increase or decrease the speed at which TalkBack speaks by doing the following:

1.   **Perform a Three Finger Swipe Right until TalkBack says "Speech Rate".**

2.   **Now perform a One Finger Swipe Up to increase the speech rate, or a One Finger Swipe Down to decrease the speech rate. Each time you swipe, the speech rate will be adjusted by 5%.**

3.   **When you've adjusted the speech rate to the desired level, perform a Three Finger Swipe Right until Characters is the current option. This is the default setting!**

Note 14: The Three Finger Swipe Right gesture is used to select various TalkBack settings. When you select the desired setting, use a One Finger Swipe Up or Down to explore the options for that setting. For reference, you can also use a Three Finger Swipe Left to cycle through the settings in the opposite direction.

Answering and Ending Calls using TalkBack

With TalkBack turned on, answering an incoming call is easy! Simply perform a Two Finger Double Tap anywhere on the screen to answer the call. When you've finished on the call, you can end it by performing a Two Finger Double Tap again.

Note 14: The Two Finger Double Tap for answering and ending calls is only available in Android version 11 and later.

A Note About the Two Finger Double Tap

The Two Finger Double Tap gesture has multiple purposes. Its main purpose is to answer and end a call. However, if you are listening to a music track, it is used to pause and then resume the audio. Similarly, if you're watching a video clip, it is used to pause and resume the playback of the video.

Typing with TalkBack

When you want to enter information into a Text Field, you first select it and then perform a One Finger Double Tap. Upon doing this, you'll be in 'edit' mode and a virtual keyboard will be displayed at the bottom of the screen.

You can now place your finger on the keyboard and slide it around until you find the character you wish to enter. As you navigate the keyboard, TalkBack announces the character you're positioned on. To enter a character, simply lift your finger when TalkBack announces the character you want. Repeat the process to enter additional characters.

If you accidentally enter the wrong character, locate the Delete key on the keyboard and then lift your finger. Upon doing this, the last character entered will be deleted!

Using TalkBack does require dedication and practice. However, once you've mastered the basics, you'll find it can help you to achieve almost all of those day-to-day tasks you need to do.