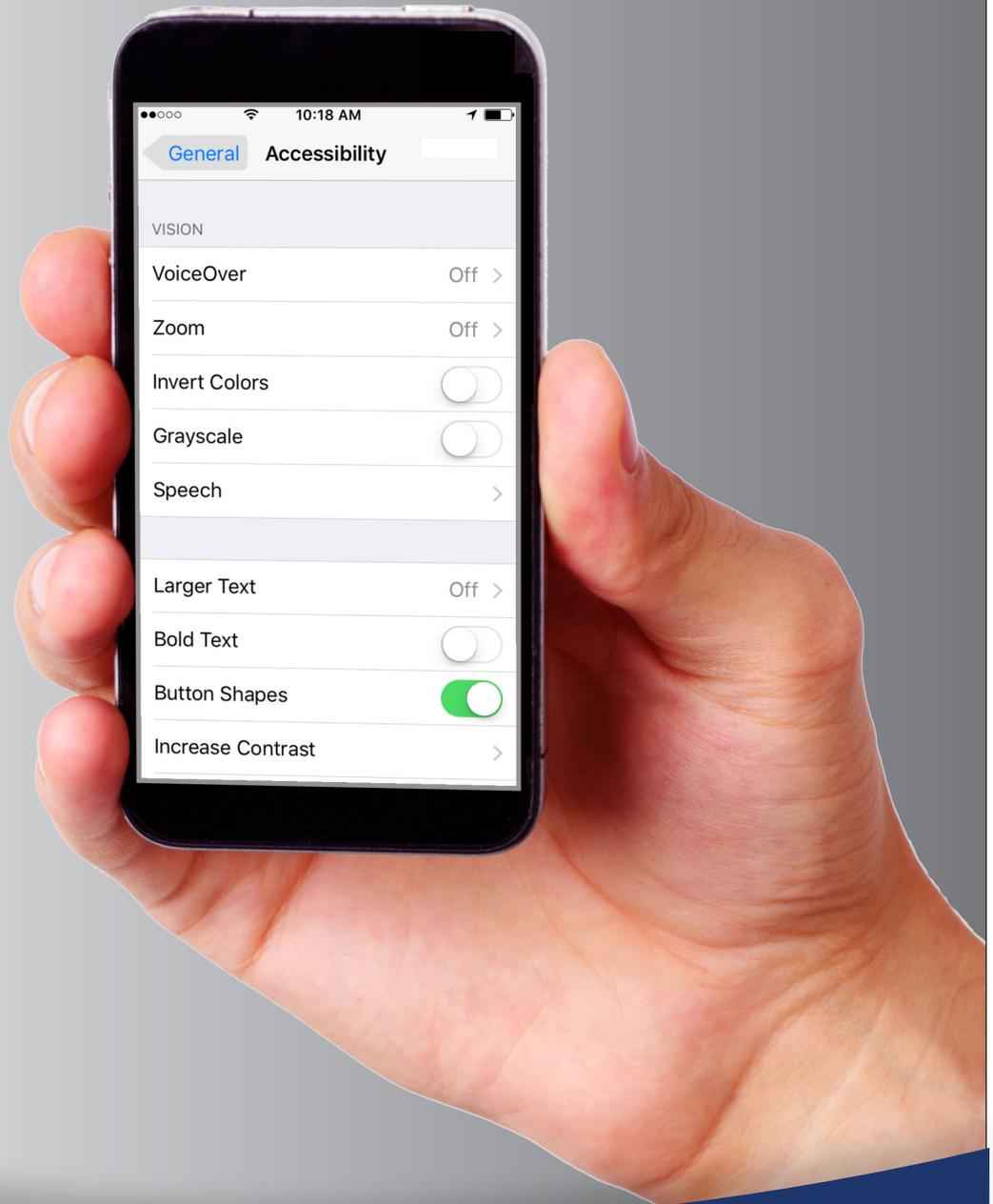




Connections

# Mobile Accessibility Guide

Make your mobile devices easier to see, hear and use



Made possible by

Consumer Technology  
Association  
**FOUNDATION**





# Mobile Accessibility

## Making Your Phone and Tablet Easier to See, Hear, and Use Student Workbook

OASIS Connections is made possible by contributions from:

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# Welcome!

Welcome to OASIS Connections! We hope you find this class to be fun, interesting, and informative.

This course is an introduction to the basic accessibility options built into Apple and Android phones and tablets including:

- How to make text larger and reduce background clutter
- How to increase contrast and use color inversion to enhance readability
- How to configure audio for clarity
- How to turn on captions
- How to set up features that can help with dexterity and motor coordination issues

We hope you have fun learning!

## About OASIS Connections

OASIS Connections is an evidence-based technology curriculum designed for adult learners. Connections classes help tens of thousands of students stay in step with today's technology through partner organizations: libraries, job help centers, adult living facilities and faith-based communities. If your organization would like more information about partnering with OASIS, contact the National Connections Manager at 314-862-2933 x 272.

Send errata, suggestions, and comments to [courseupdates@oasisnet.org](mailto:courseupdates@oasisnet.org).



# Introduction to mobile accessibility options

Many of us have become dependent on our mobile devices. We use them to communicate with friends and family, complete work tasks, stay current with the news, take and share pictures, and even find and navigate to restaurants and entertainment venues. Mobile devices have a growing number of options to enhance their usability for anyone who has difficulty with vision, hearing, or manual dexterity. This manual will introduce you to some of the basic accessibility options of Apple and Android mobile devices.

## Devices and Operating System (OS)

Apple makes the iPhone and iPad tablet. We refer to these as iOS devices because the software that they run is called iOS. Google makes the software we know as Android. Many different manufacturers, Motorola, Samsung, and LG to name a few, make phones and tablets that use the Android software. These manufacturers customize their devices so that, unlike Apple devices, no two are alike. If there is a feature listed in this manual that isn't in your phone or tablet, it may be that your operating system is out of date or the latest OS is not available for your device.

## Conventions used in this manual

### Navigation notations

Most of the settings you will study in this manual are a series of steps that require moving from screen to screen on your device. We will use the '>' (right-facing caret) symbol to indicate the sequence of screens or buttons you need to access in order to perform the operations. As an example, a setting may require a series of steps like this:

1. Tap the **Settings** icon.
2. Tap the **General Settings** icon.
3. Tap **Accessibility**.

In this manual this sequence of actions is represented as **Settings > General > Accessibility**.



## Apps

Apps are software programs that perform a specific function on your device. Examples of apps that came with your device are the Internet browser, the camera, and the email program. Apple devices are all the same out of the box. Android devices are customized by the manufacturer (Motorola, HTC, etc.) as well as the carrier (AT&T, Verizon, T-Mobile, etc.) and can vary widely. Both Apple and Android devices also allow you to download and install third-party apps, such as Facebook and Skype. These apps may have accessibility features that are independent of the phone settings. Check your app instructions for accessibility features you can access within the app. *Third-party apps that are mentioned in this manual are not an endorsement or recommendation for installation.*

## External devices

You can connect external devices, like hearing aids, TTY machines, and switches, to your phone or tablet to make it easier to see and use. Most of these are beyond the scope of this manual, but here are some devices to consider:

- Bluetooth keyboards, mice, and touchpads make navigation and typing easier.
- Apple TV (for Apple devices) and Chromecast (for Android) are two ways to mirror (project) your device's screen to a large TV or monitor.
- Hearing aids that pair with specific mobile devices have a wide range of options to enhance sound at higher volumes. Some also connect to your TV!
- Switches that connect to the device and support specific actions that may otherwise be difficult for those with motor coordination issues.
- TTY and braille devices that empower communication via your mobile device.



## More resources

There are excellent resources online including:

- **American Foundation for the Blind (AFB):** AFB has a database of devices and apps for the visually impaired. Look for them at [www.afb.org](http://www.afb.org).
- **AccessWireless:** AccessWireless is a service of The Wireless Association (CTIA) and is a great resource for researching devices and services. Visit the website at [www.accesswireless.org/](http://www.accesswireless.org/).
- **Hearing Loss Association of America:** This organization has a wealth of information about electronic hearing devices including implantable devices and cochlear implants. You can find out more at [www.hearingloss.org](http://www.hearingloss.org).
- **GARI:** The GARI site can help you find both devices and apps that can help you with accessibility questions. It features comparative search functions for devices and apps at [www.gari.info](http://www.gari.info).



# Introduction to iOS accessibility

Apple devices have a full range of accessibility options. The features we will talk about are for devices with iOS 8.

All of your accessibility settings are found by:

1. On your **Home** screen, tap **Settings** .
2. Tap **General**, then tap **Accessibility**.

In the future this sequence will be shown as **Settings > General > Accessibility**.



## Determining your OS version

Some of the features we will discuss are only in the latest operating system (iOS 8 at the time of this writing.) To determine which OS your Apple device is running:

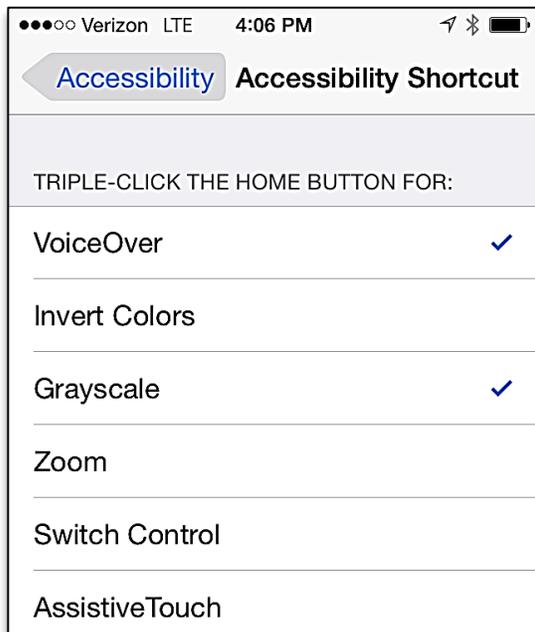
- Go to **Settings > General > About > Version**.

Some features, like Reachability, are available on certain model phones and not others. If you do not see a feature on your phone, it is likely either your software or phone model does not support it.

## Accessibility Shortcut

If you find yourself turning an accessibility feature—or several—on and off frequently you might want to try assigning the feature(s) to the Accessibility Shortcut as follows:

1. Go to **Settings > General > Accessibility**.
2. Tap **Accessibility Shortcut**.
3. Tap the feature(s) you would like to access via the shortcut as shown below.



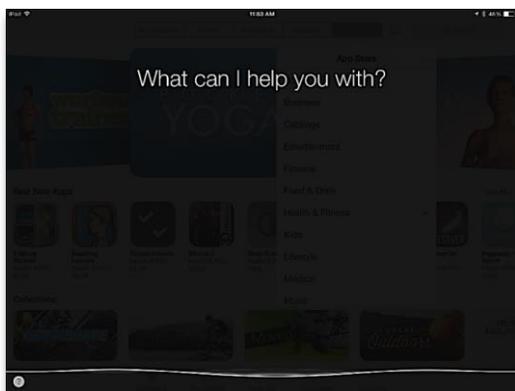
Press the Home button three times quickly to activate the Accessibility Shortcut. If you selected only one accessibility feature to the shortcut, pressing the Home button three times will toggle the feature on or off. If you selected more than one feature, pressing the Home button three times will display a menu of those features you chose in the prior step.

# iOS voice commands

## Siri, your Intelligent Personal Assistant

Siri lets you use your voice to control your iPad or iPhone. Siri can send a message, add an event to your calendar or reminder list, set an alarm, find directions, and search the Internet... all without typing a single letter. Your device must be connected to the Internet to use Siri. Here are the basics:

- Launch Siri by pressing and holding the Home button. You will hear 2 beeps and Siri will ask what she can do for you. You can also see the Siri greeting on your screen. Note that if your iPad is connected to a charger, you can activate Siri in hands-free mode by saying “Hey Siri.”



- Speak in a normal indoor voice. The line across the bottom will wiggle to indicate Siri is active.
- When you finish speaking, you can wait for Siri to sense that you are finished, or tap the microphone icon.
- Siri will respond audibly and with text with what it thinks you said. Sometimes, Siri will even prompt you with more questions. For instance, if you tell Siri to set an appointment, she will ask you for the date and time.

You can access Siri from a locked device if you have enabled the function in Settings > Passcode > Allow Access When Locked > Siri.

### Helpful Hints

Background noise and wind blowing into the microphone can make it hard for Siri to understand you.



## Some things you can do with Siri

- Send a text message without typing.
- Tell Siri to call your contacts that you have defined a relationship with in Contacts. For instance, you can say “call my sister” if your sister is designated as such in the relationship field.
- Tell Siri to call a person by name in your Contacts.
- Tell Siri to call a number. Say “dial” and then say the numbers.
- Navigate to a location with a command. Activate Siri and say “navigate to” and add the location.
- Read your last unread text message or email. You can even dictate a response.
- Initiate a FaceTime call. Activate Siri and say “FaceTime” and the name of the person you want to call.
- Launch an application. Siri can launch most apps. Say “launch” and the name of the app, e.g., “launch Facebook” or “launch Photos.”
- Set reminders, including location-based reminders. Say “remind me to buy coffee when I leave home” will create a reminder that will trigger when you physically leave your home location.
- Set alarms. Say “set an alarm for 11am” to create an alarm for that time.
- Ask questions. Ask what the temperature is somewhere, or what the current time is in another part of the world. Siri can search the web and answer questions or provide websites that might answer your questions.

## Using voice in apps

Many apps, including browsers, maps, and other apps with search boxes, often display a voice search icon . Tap the icon to input using your voice rather than the keypad.



You can also use your voice to dictate messages, Notes, email—just about anywhere you would use a keypad to type in letters.

## Google app

Google for Android devices is also available as an app for the iPhone and iPad. See the Android voice section in this manual for more information.



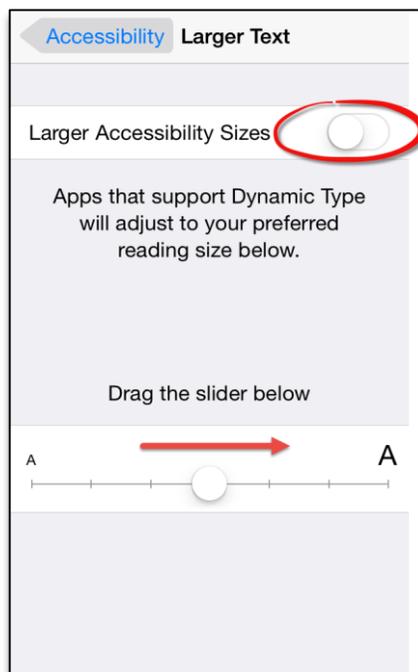
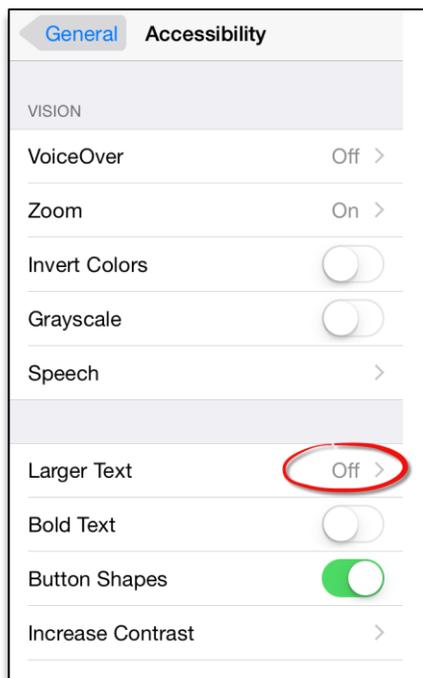
## iOS visual accessibility options

You can make text larger, bolder, change colors, and use backgrounds that make it easier to view content on the screen.

### Larger text

There are two ways to modify text size. The first is to increase text size using a slider to adjust to your comfort level. The second is to turn on Larger Accessibility Sizes and use the slider to access very large font sizes. To adjust text size:

1. Go to **Settings > General** and tap **Larger Text**.
2. Drag the slider to increase the text size.
3. To access an even larger set of text size options, tap the **Larger Accessibility Sizes** button.



## Bold Text

The fonts used in iOS 7 and iOS 8 are stylish, but thin. Bolding text can go a long way toward making things easier to see. Use Bold Text and Reduce Motion as a first step toward making your screen easier to see.

Bolding text makes text fatter and easier to see.

This is normal text.

**This is bolded text.**

To turn on Bold Text:

1. Go to **Settings > General > Accessibility**.
2. Tap the **Bold Text** button.

## Reduce Motion

Design changes introduced with iOS 7 included a 3D motion (parallax) effect that, while beautiful, was distracting to some users. You can see the effect of parallax by looking at the Home screen while tilting your device back and forth slightly. The 3D effect makes it seem as though the icons are floating slightly above the background. To turn this effect off:

1. Go to **Settings > General > Accessibility**.
2. Tap the **Reduce Motion** button.

## Grayscale

Grayscale eliminates all colors and displays everything on your screen in shades of gray. You can use Grayscale in conjunction with Invert Colors (below.) To turn on Grayscale:

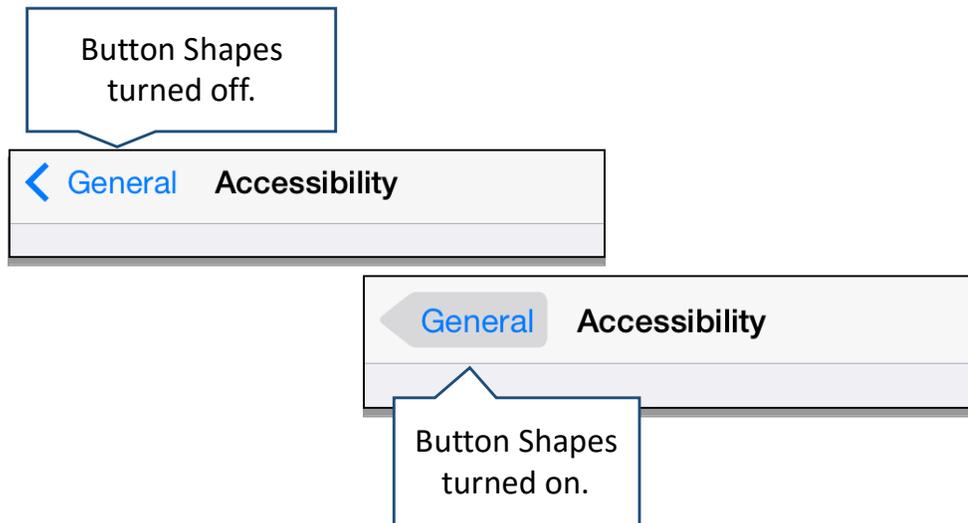
1. Go to **Settings > General > Accessibility**.
2. Tap the **Grayscale** button.



## Button Shapes

Button Shapes add a contrasting shaped border to buttons that might otherwise be hard to distinguish. To turn on Button Shapes:

1. Go to **Settings > General > Accessibility**.
2. Tap the **Button Shapes** button.



## Zoom

Zoom is a handy tool anytime you want to look up-close at something. When activated in settings, you can toggle Zoom on and off with a quick double-tap using three fingers on the screen. You can use Zoom in a window or full screen. To turn on Zoom:

1. Go to **Settings > General > Accessibility**.
2. Tap **Zoom** and tap the option buttons you want to enable.
3. Choose your options:
  - Follow Focus
  - Smart Typing
  - Show Controller
  - Zoom Region
  - Maximum Zoom Level



Turn zoom on and off with the 3-finger double-tap. Drag the zoom box around with a finger to look at different areas of the screen. Tap the small bar at the bottom of the zoom window to access settings. You can then use the slider to adjust the zoom level.

## Increase Contrast

There are three settings that you can use to control contrast for the best viewing experience:

1. Go to **Settings > General > Accessibility**.
2. Tap **Increase Contrast**.
  - Turn on **Reduce Transparency** to make items on your screen more opaque (solid and less see-through.)
  - Turn on **Darken Colors** to make dark colors more intense.
  - Turn on **Reduce White Point** to mute white and bright colors that might overwhelm your vision.

## Invert Colors

Invert Colors turns white to black and inverts other colors much like a photographic negative. This can be useful if it is easier for you to read white text on a black background. Depending on the colors on the screen, it can also make the screen less bright—a great feature for light sensitivity. Some people use Invert Colors to dim the display for more comfortable night reading. To turn on Invert Colors:

1. Go to **Settings > General > Accessibility**.
2. Tap the **Invert Colors** button.

## Home-click Speed

Some iOS features are accessed by quickly double or triple-clicking (pressing) the Home button. Users who have trouble clicking rapidly can slow the speed necessary to perform the clicks by changing the wait time as follows:

1. Go to **Settings > General > Accessibility**.
2. Tap **Home-click Speed**.
3. Choose **Slow** or **Slowest** to increase the time allowed to complete the clicks.

## VoiceOver

VoiceOver audibly describes objects like buttons and icons as you touch them on the screen. VoiceOver can also read text like the content of web pages. You can interact with the screen using touch, the on-screen keyboard, or an extensive set of modified gestures. VoiceOver has a great many options beyond those described in this manual. To activate VoiceOver:

1. Go to **Settings > General > Accessibility**.
2. Tap **VoiceOver** and tap the button to enable the feature and select options.
3. Drag the **Speaking Rate** slider to your preferred speed.

With VoiceOver turned on, tap **VoiceOver Practice** to view a tutorial and practice the gestures you will use with the feature. Some common gestures used with VoiceOver include:

- **Tap:** Tap an icon or a selection of text and VoiceOver will read or describe it.
- **Swipe right or left:** Select the next or previous item.
- **Two-finger swipe up:** Read everything from the top of the screen down.
- **Two-finger swipe down:** Read everything from the current position.
- **Double tap:** Select (activate) the item.
- **Triple-tap:** Opens or launches an app.

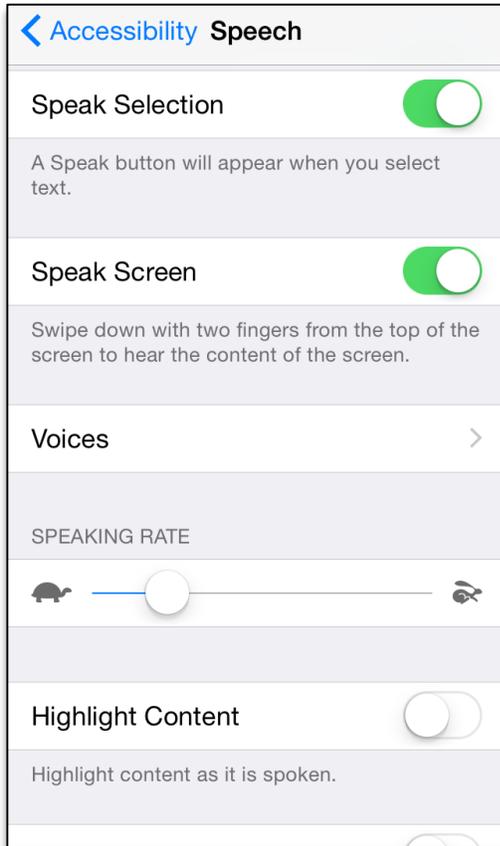
## Speak Selection and Speak Screen

You can have selected text (text you highlight) or the content of the entire screen read to you using these features. To activate Speak Text and Speak Screen:

1. Go to **Settings > General > Accessibility > Speech**.
2. Tap **Speak Selection** and **Speak Screen**.

You can select an initial speaking rate and if you want text to be highlighted as it is read to you.





Speak Text will add a Speak option to highlighted text:



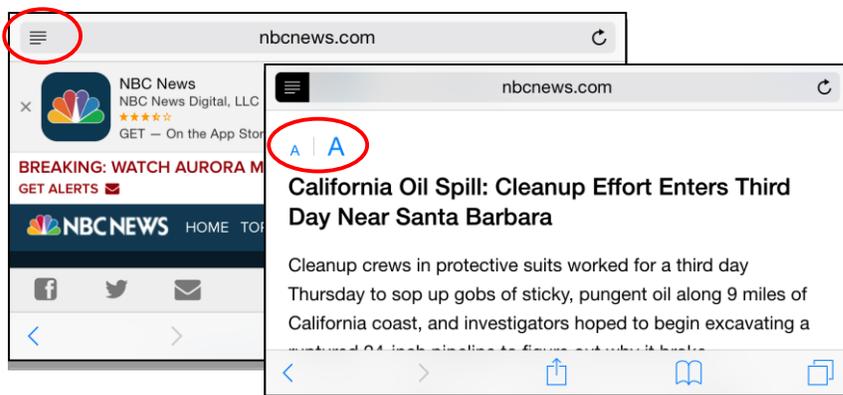
Speak Screen will read the entire screen to you. Swipe down from the top edge of the screen with two fingers to activate:



Tap  to slow the speaking rate,  to speed it up.

## Safari Reader

Safari browser users can eliminate lots of web page clutter—advertisements for instance—on pages that have Safari Reader available. When you see the Reader icon  in the URL box, Safari Reader view is available. Tap  and enjoy a clutter-free reading experience as shown below. Notice how Reader hides the ads, headers, and social media buttons and only the article text appears? Use the font size options  |  to adjust fonts to even larger sizes!



## iOS vibration notifications

You can select from a number of vibratory (haptic) notification options for apps on your iOS device.

1. Go to **Settings > Notifications**
2. Scroll down to find the app you want to set notifications for. Tap to open.
3. Turn on **Allow Notifications**.
4. Tap **Notification Sound**, scroll to the top and select a vibration pattern (or None.)

To set vibration options for system sounds:

1. Go to **Settings > Sounds** and select **Vibrate on Ring** and **Vibrate on Silent**.
2. Scroll down to the **Sounds and Vibration Patterns** section. Tap any of the apps to open the settings.
3. Scroll to the top, tap **Vibration**, and select a vibration pattern (or None.)

## iOS features for the hearing impaired

Features to assist the hearing impaired include captioning, visual alerts, and options to make sounds easier to hear. Apple has been instrumental in working with hearing aid manufacturers to create customized devices that function as voice controls, turn your phone or tablet into a microphone, and other unique features that can help you hear better in crowds or lecture halls.

### Closed captioning and subtitles

Closed Captioning (CC) adds visual text to describe the full context of a video including descriptions of sounds (like screams and crashes) and music. Subtitles are simply a text version of the spoken word primarily used for translations. (Although subtitles can be useful in noisy environments). On iOS devices, captions and subtitles are turned on

together. Captions have preference if both features were included in the media. It is important to note that although CC may be turned on for your device, apps have their own settings that may need to be turned on. For instance, even if you have turned captions on for your device, videos you play on Netflix will not display the captions unless you also turn them on in NetFlix settings. The NetFlix captions will adopt the preferences you select for captioning for your device, i.e., Large, Classic, etc. Your caption settings may not apply to all apps. To turn on captioning and subtitles:

1. Go to **Settings > General > Accessibility > Subtitles & Captioning**.
2. Tap **Closed Captions + SDH**.

Tap **Style** to choose the size and colors used for the text-captioning box.



From left to right: Classic, default, and large styles

You can also create your own custom style using the controls under **Create New Style**.

## LED Flash for Alerts (iPhone only)

You can set your iPhone or iPad up to provide visual alerts in addition to or instead of audible alerts. This feature uses the camera flash as a visual indicator that you have received a call, text, or other alert. To turn on LED Flash for Alerts:

1. Go to **Settings > General > Accessibility**.
2. Tap the **LED Flash for Alerts** button.

## Mono Audio

Mono Audio disables stereo reception so that all audio information is received equally on both left and right channels.

1. Go to **Settings > General > Accessibility**.
2. Tap the **Mono Audio** button.

You can also adjust the volume to be louder on either the right or left channel by using the L/R slider.

## Phone Noise Cancellation (iPhone only)

This feature reduces ambient noise during phone calls so that it is easier to hear the caller rather than the background. To enable:

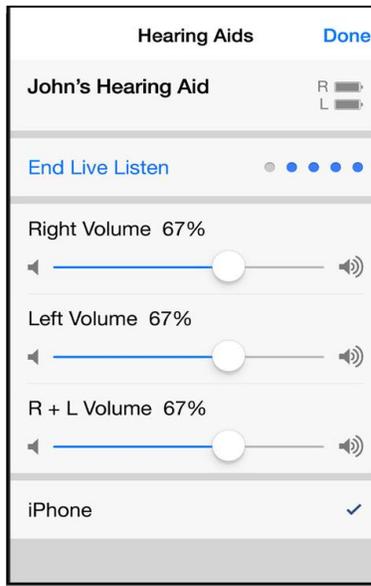
1. Go to **Settings > General > Accessibility**.
2. Tap the **Phone Noise Cancellation** button.

The Phone Noise Cancellation feature can be helpful, particularly if you are holding the phone to your head. Some users have reported that the feature has also made it more difficult for people to hear or made their calls sound 'weird.' If calls on your iPhone handset sound abnormal, or if you are paired with hearing aids, you may want to turn the Phone Noise Cancellation feature off.

## Hearing aids

Made for iPhone hearing aids can be customized from your iPhone (or Apple Watch even.) More than just hearing aids, many can be used to stream music and television, and even used as remote microphones. To find a list of compatible devices, go to [apple.com/accessibility/iOS/hearing-aids](http://apple.com/accessibility/iOS/hearing-aids).





Screenshot via Apple

## iOS features for interaction

### Reachability

Reachability is a feature available on the iPhone 6 and iPhone 6 Plus. The larger screens on these smart phones can make it more difficult to type and reach buttons with a thumb without repositioning or using two hands. Reachability moves the screen contents—icons, windows, etc.— to the lower part of the screen for easier access when you double-tap (not double-press) the Home button. The feature automatically turns off with the next touch of the screen or Home button. To activate the Reachability feature:

1. Go to **Settings > General > Accessibility**.
2. Tap the **Reachability** button.

Anytime you need to move things closer, just lightly double-tap the Home button.

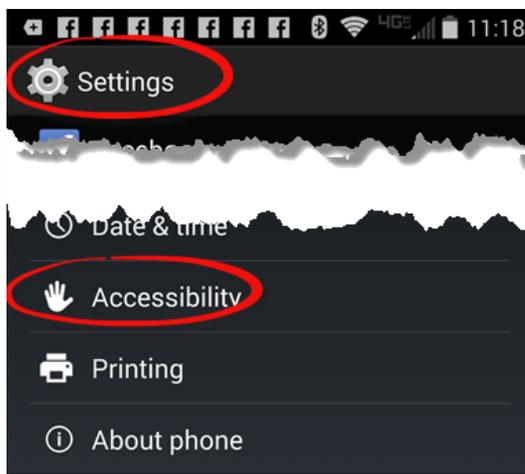
Apple devices can work with switches and assistive touch devices if interaction with the screen is not an option.

# Introduction to Android accessibility

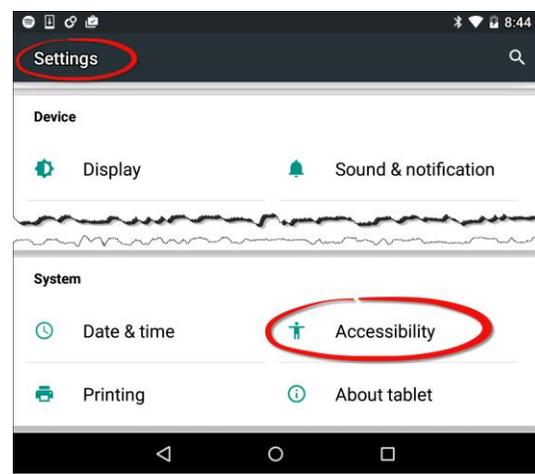
Android accessibility features vary by operating system version. Some of the features in this manual are only available on devices running Android version 5 and higher. Most of the options you will need are under Settings > Accessibility. However, be aware that there are additional features under Sounds, Sound & notification, Display, and Keyboard depending on your phone model and Android version.

Here is how to open your accessibility options screen:

1. From your **Home** screen, tap **Settings** . If the Settings icon is not visible, tap **View all apps** , then scroll right-to-left to find **Settings** (apps are in alphabetical order). You can also swipe down from the top (opens notifications), tap to switch to quick settings , then tap **Settings**. To place the **Settings** icon on a **Home screen**, touch and hold the **Settings** icon until the screen changes, then drag and drop it on the **Home screen** you want to place it on.
2. Scroll down to the **System** group and tap **Accessibility**. The icon is a hand  (prior to version 5) or a human figure . In the future this sequence will be shown as **Settings > Accessibility**.



Android version 4



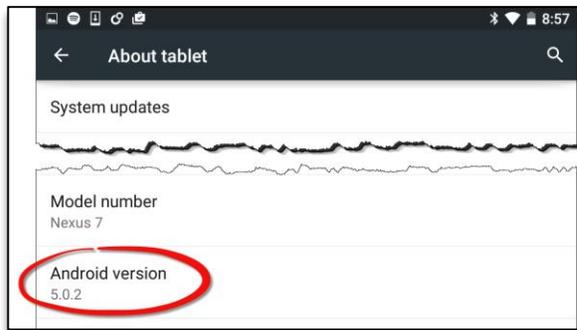
Android version 5

## Determining your Android version

Contact your phone carrier (ATT, Verizon, Sprint, etc.) if you have questions about upgrading to a newer Android software version.

To determine the OS version your Android device is currently running:

- Go to **Settings > About phone > Android version**



The device shown here is version 5, known as Lollipop.

## Touchless Control - voice control for Android

The Google app is available as a download for Apple devices, and comes preinstalled on Android. The Google app lets you use your voice to control your phone and conduct internet searches. Google can send a message, have a message read to you, add an event to your calendar, set an alarm, find directions, and search the internet... all without typing a single letter. Your phone or Android device must be connected to the internet to use Google voice search.

### Start a voice search

All Apple and Android phones with the Google app

- Open the Google app then tap the microphone icon.

All Android phones by touch

- Swipe up from the bottom of the screen.
- In the search bar at the top of each home page, tap the microphone.

## OK Google

You can activate listening mode by saying "OK Google." This phrase works whenever the Google app is open on any phone, and can be configured to work on an Android phone from the Home screen or even when the phone is locked. Note that your Android phone may differ from the following depending on the manufacturer.

### Setting Android options for the launch phrase "OK Google"

1. Open the **Google** app.
2. In the top left corner of the page, touch the Menu icon ☰ then go to **Settings > Voice > "Ok Google" detection** and select from the following options:
  - **From the Google app** Usually on by default and means that you can speak the launch phrase when the Google app is open and active (the app you are currently using.)
  - **From any screen** Select this if you want the launch phrase "OK Google" to start a voice search from any screen as long as the phone is on and unlocked.

**Note:** The **From any screen** setting may prevent other voice services that use launch phrases or wake up commands from working. For example, if you have a Samsung S6 and turn on S-Voice to use the wake up command "Hi Galaxy," it may not work if **From any screen** is turned on.

- **Always-on** Google will respond when you say "OK Google" whether or not your screen is active.
- **Trusted voice** Will unlock your phone if Google recognizes your voice when you say "OK Google".
- **Personal results** See personal results for your voice searches when your phone is locked.
- **Train/Retrain voice model** Teach Google to recognize your voice.

## Using voice in apps

Many apps, including browsers, maps, and other apps with search boxes, often display a voice search icon . Tap the icon to input using your voice rather than the keypad as shown on this screenshot of the Chrome browser on an Android device.



You can also use your voice to dictate in text messages and email—just about anywhere you would use a keypad to type in letters.

## Some things to remember when talking to your phone

- Speak in a normal indoor voice. The red circle will pulse to let you know the phone hears you.
- When finished speaking, you can wait for Google to sense that you are finished, or you can tap the red circle.
- Google may ask follow-up questions to understand on what you are asking or commanding. For instance, if you tell Google to set an appointment, Google will ask you for time, date, and title of the event.

## Some things you can do with Google

- Tell Google to call your contacts that you have defined a relationship with in Contacts. For instance, you can say “call my sister” if your sister is designated as such in the relationship field.
- Tell Google to call a person by name in your Contacts.
- Tell Google to call a number. Say, “dial” and then say the numbers.
- Navigate to a location with a command. Launch Google and say “navigate to” and add the location.
- Check your voicemail. Say, “Listen to voicemail.”
- Launch an application. Google can launch most installed apps. Say “launch” and the name of the app, e.g., “launch Facebook” or “launch Photos.”
- Set reminders, including location-based reminders. Say, “Remind me to buy coffee when I leave home,” will create a reminder that will trigger when you physically leave your home location.
- Set alarms. Say “set an alarm for 11am” to create an alarm for that time.
- Ask questions. Ask what the temperature is somewhere, or what the current time is in another part of the world. Google will search the web and answer questions or provide websites that might answer your questions.
- Say, “OK Google, help me” for a list of commands.

## Troubleshooting

Remember that background noise and blowing wind will make it hard for Google to understand you.

Android:



- If saying “Okay Google” does not launch the Google microphone, try “OK Google Now”.
- If Google will still not launch, go to **Settings > Touchless Control** and make sure Touchless Control is checked.
- Go to **Settings > Touchless Control > Train launch phrase** to train your phone to recognize when you say the launch phrase.

## iOS

If saying “Okay Google” does not launch the Google listening mode on iOS phones, make sure Google has access to the microphone: iOS Settings > Privacy > Microphone > Google > On.

# Android visual accessibility options

## Wallpaper and backgrounds

You can choose between a number of stock static (non-moving) and dynamic (moving) background options. Some backgrounds can obscure text and icons. You can pick the least distracting option or use a photo you take from your phone. You can also take a picture of a white, gray, or black background to use as a plain color for your background if that makes viewing your Home screens easier. To set your wallpaper preference:

1. Go to **Settings > Display > Wallpaper**.
2. Choose from the **Gallery, Wallpapers**, or **Photos** options and browse for your preference. Tap any to preview.

## Android large text settings

Android has a large text setting that enlarges text in many apps. To turn on large text:

1. Go to **Settings > Accessibility**.
2. Tap **Large text**.

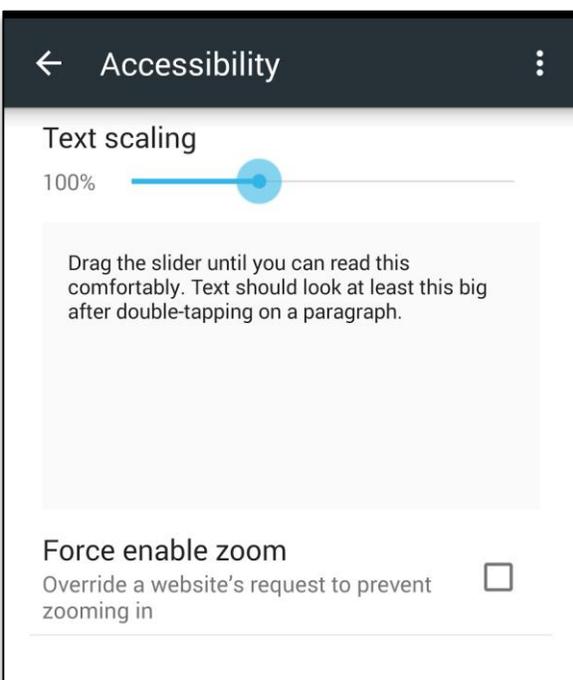
If you want something even larger, or something in-between, go to Settings > Display > Font size and choose from Small to Huge.





You'll notice that not all text is resized with this setting. It will depend on the app. The Chrome Internet browser is an example. The URL in the search box is larger, but the web page content is not affected. Chrome has its own settings to increase text size as follows:

1. Open the **Chrome** browser , then tap the **Menu**  button in the upper right corner.
2. Tap **Settings > Accessibility**.
3. Drag the slider to the desired text size. Watch the text under the slider bar to judge when you have a comfortable size selected.
4. Tap the checkbox next to **Force enable zoom** to make all websites zoom to your desired level, overriding the website's settings if necessary.



## Android magnification gestures

Turn on magnification gestures to enable a zoom box that you can adjust to see a specific part of the screen. To turn on magnification gestures:

1. Go to **Settings > Accessibility**.
2. Tap **Magnification gestures** and turn on the button.

Triple tap the screen with one finger to toggle magnification on and off. When magnification is toggled on, you will see a blue or orange border around the screen and the contents will be enlarged. Use two fingers to drag the focus area around the screen. Use a 2-finger pinching motion to either enlarge or decrease the zoom level.

You can also use magnification to temporarily zoom in on an area. Triple-tap and hold your finger down on the last tap. Magnification will turn on and you can drag your finger around to look at different parts of the screen. Once you release, magnification will turn off and your normal view will return.

## High contrast text

Applies to Android 5+ only

1. Go to **Settings > Accessibility**.
2. Tap **High contrast text**.

High contrast text eliminates shades and colors in text and makes all text either black or white depending on the original color.

## Color correction

Applies to Android 5.0+ only

Color correction manipulates colors to compensate for color blindness. You can set the feature for different correction modes as follows:

1. Go to **Settings > Accessibility**.
2. Set the switch to on and select from the mode options:
  - Deuteranomaly (red-green)
  - Protanomaly (red-green)
  - Tritanomaly (blue-yellow)

## TalkBack

Applies to Android 4+ only

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TalkBack is a screen reader that speaks the names of items you are touching on the screen, reads text, and announces alerts like incoming phone calls. Because TalkBack describes what you are touching, single taps or touches are disabled, requiring users to learn a new set of gestures. If TalkBack is not installed on your phone or tablet, you may be able to download it from the Google Play Store. To enable TalkBack:

1. Go to **Settings > Accessibility**.
2. Depending on your Android version, enable the **TalkBack** checkbox or slide the switch (Android 4 return to previous screen and enable **Explore by touch**).

The first time you enable TalkBack you will have to confirm that you will allow the app to observe your actions—things like the buttons you are touching and the text you type. The first time you enable TalkBack will also open a training tutorial with hands-on practice of the gestures required to use the app.

Action	Gesture
Move to first item on screen	Up then down
Move to last item on screen	Down then up
Open local context menu	Up then right
Open global context menu	Down then right
Home button	Up then left
Back button	Down then left
Recent apps	Left then up
Notifications	Right then down
Scroll to next screen	Two-finger swipe left or up
Scroll to previous screen	Two-finger swipe right or down

If you are using TalkBack you might want to disable the Auto-rotate screen feature to prevent audio feedback from being interrupted if you move the phone:

1. Go to **Settings > Accessibility**.
2. Deselect **Auto-rotate screen**.



# Android vibration feedback and alerts

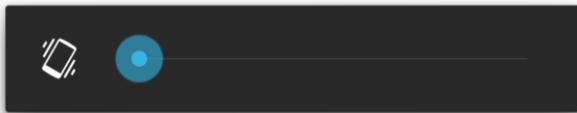
Android devices can provide audio and vibration (haptic) feedback when you tap icons, buttons, and keyboard items. Some of these are accessed in Settings, and others “in-app” or through the settings offered in the app rather than Android system settings. These settings differ between the latest Android OS (Lollipop) and prior versions (KitKat and prior.)

## Android KitKat

Most of the system audio and vibratory feedback options are accessed as follows:

1. Go to **Settings > Sound**.
2. Choose from the following: **Vibrate when ringing; Touch Sounds; Dial pad touch tones; Screen lock sound; and Vibrate on touch**.

App notifications are controlled from the app settings. To use the vibration notification feature, turn down the volume (using the external down-volume button) until sound is turned off and vibration alerts are turned on. You’ll see a vibration icon to the left of the volume bar as shown here:

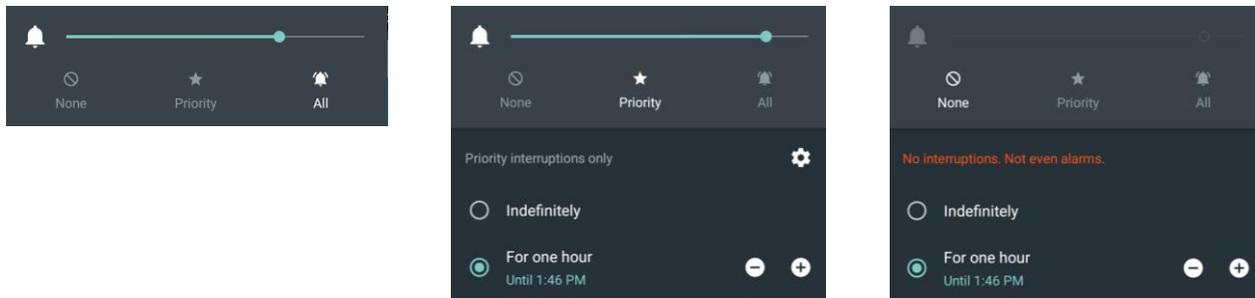


## Setting up notifications in Lollipop

Android Lollipop introduces a completely new approach to notifications. You will first need to enable or block notifications by app. Then you can use the volume and notifications menu to choose how the alerts work. To turn on app notifications:

1. Go to **Settings > Sound & notification > App notifications**.
2. Tap the app you want to set notifications for. Leave both **Block** and **Priority** off to allow notifications. Select **Block** if you do not want the app to send notifications, **Priority** to allow notifications when in Priority mode as discussed below. Note that there may be in-app notification settings as well. For instance, Facebook has a number of settings that define what kinds of notifications you receive.

Once you have selected which apps you want to receive notifications from, you will use the volume button and the notification settings to sound and vibration on and off. Note that the current version of Lollipop (5.2) does not allow for both sound and vibration. To turn on vibration, use the volume control to turn sound off while in the All mode.



**All** (with volume turned up): All notifications make an audible noise.

**All** (with volume turned all the way off): All notifications vibrate.

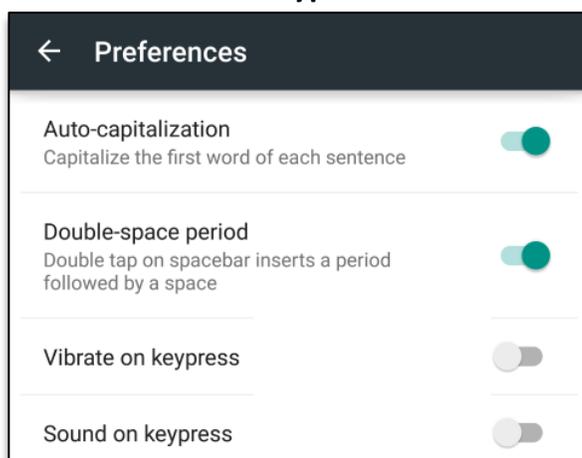
**Priority**: All notifications are silent except those you have set priorities for. Note that alarms are always exceptions.

**None**: All notifications off.

## Lollipop keyboard

You can set both audio and vibratory feedback for the standard Google keyboard as follows:

1. Go to **Settings > Language & input > Google Keyboard > Preferences**.
2. Activate **Sound on keypress** and **Vibrate on keypress** as desired.



# Android manual dexterity options

## Touch & hold delay

Sometimes you need to press and hold an icon or section of text to complete an action. Selecting a longer Touch & hold delay can be helpful for those with dexterity issues that might cause inadvertent taps or movements on the screen. By default, the delay is set to short. To change the timing:

1. Go to **Settings > Accessibility**.
2. Tap **Touch & hold delay** and select **Short, Medium, or Long**.

## Hang up with the power button

You can add the option to end phone calls with a press of the power button. To enable:

1. Go to **Settings > Accessibility**.
2. Tap **Power button ends call**.

## Double tap home launch

Android phones almost always display a Home button ( or ) on the bottom edge of the device. (The Home button is not visible when viewing apps, like movies, full-screen. If the Home button is not visible, tap the screen once to exit full-screen and display the navigation buttons.) Double tapping Home takes you to your main Home screen or launches an app, depending on what the device manufacturer has set. You can change that to another app by:

3. Go to **Settings > Accessibility**.
4. Tap **Double tap home launch** and select from the list of apps.

Note that a long press of the Home button also launches an app, but it is not configurable in Accessibility. There are a number of third-party apps that can customize and add functions to the Home button, including Home2 Shortcut and others.



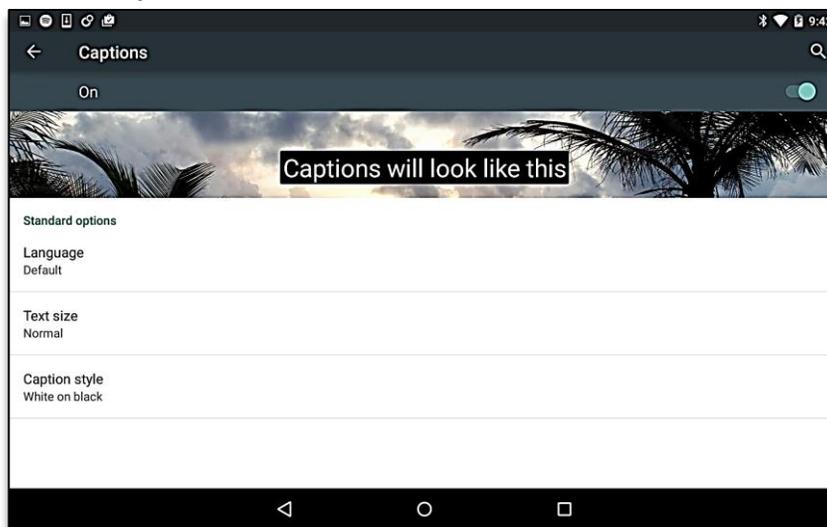
# Android features for the hearing impaired

## Captions

Applies to Android 4.4+ only

Closed Captioning (CC) adds visual text to describe the full context of a video including descriptions of sounds (like screams and crashes) and music. Captions work with some apps but often you need to turn captions on in the apps themselves. To turn captions on for your device:

1. Go to **Settings > Accessibility**.
2. Set the **Captions** switch to **On**.



Choose the **Text size** and **Caption style** options you prefer, or create your own style in **Custom** settings.

## For more help

Need more information about your Android device? Try your owner's manual and your cellular phone provider's website. You can also access information through Google's Android Accessibility Help website at <https://support.google.com/accessibility/android>. Finally, you can download Google's free Android Quick Start books at the Google Play Store.



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