# Using the iPad with Blind and Low Vision Students

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# Class Objectives

1. \_\_\_\_ Able to list the basic features of the iPad
2. \_\_\_\_ Able to move through the applications on the iPad with the VO-Arrow Keys
3. \_\_\_\_ Able to move to move through the applications on the iPad with a Braille keyboard with Dot-1 chord and Dot-4 chord
4. \_\_\_\_ Able to prepare classroom work in a text editor/word processor
5. \_\_\_\_ Able to use the Spelling Checker with writing apps
6. \_\_\_\_ Able to share and organize files using Cloud services.
7. \_\_\_\_ Able to navigate through web sites with the VO-Arrow Keys and select items with VO-Spacebar
8. \_\_\_\_ Able to navigate through web sites using Gestures
9. \_\_\_\_ Able to use iPad apps designed for blind/low vision students, including special needs
10. \_\_\_\_ Able to use educational iPad apps with a Braille display
11. \_\_\_\_ Able to use iPad apps functional for low vision children
12. \_\_\_\_ Able to use iPad apps designed for children with cortical vision impairment
13. \_\_\_\_ Able to use the Talking Scientific Calculator with low vision/blind students
14. \_\_\_\_ Able to use the Calendar
15. \_\_\_\_ Able to use Zoom screen enlargement on the iPad

Bruce McClanahan, Assistive Technology Specialist, Vancouver, WA

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# Resources

## Apple VoiceOver Manual

Download the current VoiceOver manual to in your iPad.

<https://support.apple.com/manuals/ipad>

Apple Accessibility

<https://www.apple.com/accessibility/iphone/vision/>

Common Braille Commands for VoiceOver Navigation (Apple site)

<http://support.apple.com/kb/HT4400>

Common Bluetooth Keyboard Commands for VoiceOver (Apple site)

<https://support.apple.com/guide/ipad/use-voiceover-with-an-apple-external-keyboard-ipad9a246749/ipados>

AirPrint Enabled Printers (Printers that work with the iPad, most newer printers do)

<http://support.apple.com/kb/HT4356>

Apple Accessibility Toll-Free Number: (877) 204-3930

## Other Resources

Perkins Learning

<http://www.perkinselearning.org/technology/blog/getting-started-voiceover-ipad>

The Wisconsin Center for the Blind and Visually Impaired maintains an excellent blog.  
[www.iaccessblog.com](http://www.iaccessblog.com/)

Oklahoma School for the Blind

Teachers at this site have written many excellent training manuals, including an excellent manual on using the iPad.

[Oklahoma School for the Blind Assistive Technology](http://www.osb.k12.ok.us/new/index.php?option=com_content&view=article&id=30&Itemid=166)

Many excellent guides are produced by AppleVis, for vision impaired iOS users:

[www.applevis.com/guides](http://www.applevis.com/guides)

AppAdvice.com

Maintains a list on apps for blind and low vision students, along with apps on many other categories.

<http://appadvice.com/applists/show/apps-for-the-visually-impaired>

My Digital Apex: Training Manuals

<http://mydigitalapex.com/>

Ed Summers/Diane Brauner: SAS Institute

<http://support.sas.com/misc/accessibility/education/ios/quickref.html>

How to Use VoiceOver on and iPhone & iPad: iMore

<https://www.imore.com/how-use-voiceover-iphone-and-ipad>

Washington State School for the Blind: Statewide Technology Project

Bruce McClanahan, Assistive Technology Specialist

<https://www.wssb.wa.gov/services/statewide-technology-services>

Extensive VoiceOver Command List

<https://pauljadam.com/demos/voiceovercommands.html>

**Is a Software Product Accessible?**

VPAT: Voluntary Product Accessibility Template

Check out the VPAT that the respective company has filed to determine how well their product meets Section 508 guidelines. Google VPAT and the product name…

# Getting Started

*Go to Setting, then Display and Brightness. Set Auto-Lock for the longest time limit that your IT allows. Make sure that your iPad has the current iOS version installed. VoiceOver and Zoom can work together.*

## Using the Home Button

* Press the Home button once to go to the Home Screen, on units without a Home button swipe up to go to the last Home Screen that you used. Swipe up once more and you are at your main Home Screen.
* Press the Home button twice to go to the App Switcher, on units without a Home button swipe up from the bottom of the screen and hold your finger for a split second.
* Press the Home button three times to turn VoiceOver on and off, on units without a Home button press the Power button quickly three times.

Go to Accessibility settings, select to turn on VoiceOver with a triple-click Home. Note that there are currently nine other settings for this option; Assistive Touch, Classic Invert Colors, Color Filters, Magnifier, Reduce White Point, Smart Invert Colors, Switch Control, VoiceOver, and Zoom. Some cases make use of the Home button difficult.

## Verbosity

Use either the Rotor or the Bluetooth keyboard to configure Verbosity. I find that I am much more accurate when using the Bluetooth keyboard, but this is personal choice.

Control+Option+Command+Right Arrow Key: Cycles through options

Control+Option+Command+Up or Down Arrow Key: Changes selection

## Activity 1

1. Go to Settings, then General
2. Go to Accessibility, then go to VoiceOver
3. Go into VoiceOver Practice, use the Gestures, Braille keyboard commands, and Bluetooth keyboard commands in the Practice Area. Practice will only become visible when VoiceOver is turned on.

# VoiceOver Configuration

Go to Setting, then VoiceOver and review the options available. All of these options can be configured; the Rotor probably has the most configuration options.

* VoiceOver
* Practice (Only displays when VoiceOver is on)
* Speaking Rate
* Speech
* Verbosity
* Braille
* Audio
* Commands
* Activities
* Rotor
* Rotor Actions
* Typing
* Always Speak Notification
* Navigate Images
* Large Cursor
* Caption Panel
* Double-Tap Timeout

## Speech Configuration

Connect a Bluetooth keyboard to your iPad. Practice the options listed below.

Control+Option+Command+Right Arrow or Left Arrow Key: Cycles through options

Control+Option+Command+Up or Down Arrow Key: Changes selection

The available options are Use Phonetics, Use Pitch, Audio Ducking, Volume, Speech Rate, Punctuation, Typing Echo, and Sounds.

## Concept

Most of these commands work with Pages, Voice Dream Writer, or Google Docs.

## Braille Contractions

Braille display output, input, and screen input can be selected as uncontracted six-dot Braille, uncontracted eight-dot Braille, or Contracted Braille. Automatic Braille translation can be selected. When writing in UEB Grade 2 Braille in the iPad contractions are automatically entered. Do not stop writing in the middle of a word or a contraction may be entered. If this becomes a problem, go to Braille display input and turn off “Automatic Braille Translation.” If you want to correct a single letter enter dots 5-6 (UEB Grade 1 indicator) and then the letter.

## Braille Settings

* Output
* Input
* Braille Screen Input
* Braille Tables
* Status Cell
* Equations Use Nemeth Code
* Show Onscreen Keyboard (I usually have this off)
* Turn Pages when Panning
* Word Wrap
* Alert Display Duration
* Ignore Chord Duration
* Auto Advance Duration
* Choose Braille Display: Note that the Braille display **is usually selected** in VoiceOver; it is not selected in Bluetooth. **However some new Braille displays, such as the APH Chameleon 20 & APH Mantis Q40 are selected in Bluetooth.** Only one Braille display can be active at a time.

# Pages

Pages works very well with VoiceOver. Pages has the following buttons. Press Escape on a Bluetooth keyboard to exit any button, press B-Chord when using the Braille display to exit any button. Pages can print, an Airprint printer is required.

* Documents Button: Use to create new documents or to load a document that you have already created.
* View Options
* Table of Contents
* Undo
* Document Title: Double tap to rename
* Format Button: Select text and then use this button to format. Use either the shift key+arrow keys on the Bluetooth keyboard or use 2-5-6+Space from the Braille keyboard to select text
* Insert Button: Media, Tables, Charts, Shapes
* Collaborate: Files can be opened in another app, such as DropBox
* More
* Tools: Share and Print, Find, Document Setup, Settings, Help

## Using Pages with a Braille Keyboard

Navigate through Pages with a Dot-1+Space or Dot-4+Space. Select buttons with a 3-6+Space.

Once the user moves to the editing screen it is necessary to press 3-6+Space twice to begin editing. The 3-6+Space when in the editing screen can be used to alternate between the top and bottom of the document. Pages will report “insertion point at start” or “insertion point at end.”

## Activity 2

Practice entering the following text on the Braille keyboard. Make several spelling errors, we will be using the spelling checker later. Note that 250 – 275 words equals a standard page,

You may want to practice this activity with the screen off, to do this tap the keyboard three times with three fingers before you get started. Repeat this keystroke to turn the screen back on.

Dear Pat,

I am glad to hear that you are finally coming to Washington. The first two days we are camping in the Columbia River Gorge. Then we can go skiing. Did you know that there is skiing on Mt. Hood in the summer? Is it true that you are now *snowboarding* rather than skiing? That is so cool. Thursday, we will visit Cannon Beach. The last day we can spend shopping in Vancouver.

Sincerely, Your Name

Practice navigating through the text that you have just written using the keystrokes listed below. The function of the item setting can be changed by using the rotor. There is a more extensive list of Braille keyboard commands at the end of this document. Several of the web resources listed at the beginning of this document have a comprehensive list.

Dot-2+Space: Pan Braille to the left

Dot-5+Space: Pan Braille to the right

Dots-3+Space: Move to the previous item using rotor setting

Dots-6+Space: Move to the next item using rotor setting

1-2-3-5+Space: **R**ead text from current position

1-2-3-4+Space: **P**ause reading of text

1-5+Space: **E**nter key

3-6+Space: Select button

### Change the Function of the Rotor Setting

Before getting started go into the rotor and change the function of the item to words, then practice navigating through the text. Then change the function of the item to characters, then lines, and practice navigating through the text.

## Activity 3: Inserting & Deleting

Open the document you just created and make the following changes. Before getting started you will probably want to adjust the function of the rotor to words. Text can only be selected moving forward. Note that once text is selected it does not need to be deleted; just keyboard over it.

2-5-6+Space: Selecting text

1-4-5+Space: **D**eletes text

7+Space: Deletes text

1-4+Space: **C**opy text

1-2-3-6+Space: Paste text **V**

1-2-3-4-5+Space Quick Nav off

* Change “*Washington*” to “*Iowa*”
* Change “*Columbia River Gorge*” to “*Lake MacBride State Park*”
* Change “*on Mt. Hood in the Summer?*” to “*near Dubuque, Iowa.”*
* Change “*Cannon Beach*” to “*Mississippi River Museum and Aquarium*”
* Change “*Vancouver*” to “*Dubuque*”

### Spelling Checker

Use the rotor to access misspelled words. A Braille display is very useful when checking spelling.

## Obtaining a Braille Copy

With a Pages document open select More, then Export. Select Microsoft Word format.

## Using Pages with a Bluetooth Keyboard

Use the commands listed below. Initially you will probably be using VO-Left or Right Arrow the most. Exit any button with the Escape key. Once you are in the editing screen it will be necessary to enter VO-Spacebar twice to begin editing. VO-Spacebar when in the editing screen can be used to alternate between top and bottom of the document.

VO-A: Read all from current position

VO-B: Read from top

VO-M: Move to the Status Bar

VO-H: Press the Home Button

VO-Left or Right Arrow: Move between items

VO-Spacebar: Select

VO-Spacebar (twice): Activate

VO-CMD-Left or Right Arrow: Verbosity

VO-CMD-Up or Down Arrow: Adjust Verbosity

Eject key: Shows/Hides onscreen keyboard

VO-K: Keyboard help

VO-Q: Quick Keys

## Activity 4

Enter the following text on a Bluetooth keyboard. The commands on the next page will be useful when reviewing and navigating text. To turn the screen off, tap the keyboard three times with three fingers. To turn the speech off, tap the keyboard two times with three fingers.

1. Which side won the battle of Gettysburg?
2. What was the name of the general commanding the Union forces at Gettysburg?
3. What was the first *major engagement* of the Civil War?
4. Which Union general would sometimes have a cucumber soaked in vinegarfor breakfast?
5. What was the name of the Union ship that engaged the Merrimac to a draw?

## Navigation Commands

Add the shift key to any of the commands listed below to select text. Turn Quick Nav off or some of these commands will not work.

* Option-Left or Right Arrow keys: Moves forward or backward by words
* Left or right arrow keys to navigate by words
* Control or Command-Up Arrow: Top of Document
* Control or Command-Down Arrow: Bottom of Document
* Control or Command-Left Arrow: Beginning of line
* Control or Command-Right Arrow: End of line

## Editing & Speech Commands

VO-W is very useful for checking spelling. Sometimes you will want to use VO-B; this will read from the top, including the menus.

* Command-C: Copy
* Command-V: Paste
* Command-X: Cut
* VO-A: Read all from current position
* VO-W: Read current word, press twice to spell the word

## Activity 5: Inserting and Deleting

Open the document that you just created and make the following changes. Use the shift key and the navigation keys to select text. Note that once text is selected it does not need to be deleted; new text can just be keyboarded over it.

* Change “*Gettysburg*” to “*Vicksburg*”
* On the third sentence change “f*irst*” to “*last*”
* On the last sentence change “*Merrimac*” to “*Monitor*”

# Voice Dream Writer

Voice Dream Writer is a text editor that works very well with VoiceOver. Voice Dream Writer supports Markdown. Voice Dream Writer has the following buttons. Press Escape on a Bluetooth keyboard to exit any button, press B-Chord when using the Braille display to exit any button.

* File Manager: Use this button to select files that you have previously created and to delete files. Also use this button to access your iCloud account.
* Add Document: Use this document to create or import from an external location such as Dropbox or Google Drive
* Export: Close, Copy All Text, Send Text, Open File in Another App, Export File to External Location
* Filename
* Audio Settings: Extensive settings, unique setting is the ability to change proofreading from Natural (read for content) to Detailed (read for grammatical errors)
* Visual Settings: Extensive low vision settings, including Black on White and Colors
* Tools: Find Text and Check Spelling, under Advanced Settings the Sidebars can be turned on or off
* VoiceOver Toolbar: This toolbar is only present when VoiceOver is running. It is at the bottom of the screen when using a Bluetooth keyboard; it is just above the onscreen keyboard when this keyboard is visible. It has the following options:   
  Cursor: Moves the cursor  
  Cursor Movement Unit: Adjustable, the cursor can be selected to be moved by character, word, sentence, or paragraph  
  Select Text: Uses the selected cursor movement to select text, double-tap with one finger to Copy, Cut, Paste, or Cancel

## Activity 7

Write a few sentences from Activity 4 in Voice Dream Writer. Make several spelling mistakes and practice using the spelling checker.

### Voice Dream Writer Sidebars

Practice opening and closing the left and right sidebars. Use a three-finger flick to open the left sidebar, close it, and then use a three-finger flick to open the right sidebar. Have a Bluetooth keyboard connected. Option+Left or Right Arrow can also be used to do this, but the three-finger flick seems to be more intuitive to me.

Tip, it is not necessary to select a word to have that word populate the edit field in the Word Finder sidebar. It is only necessary that the cursor be in contact with that word.

The left sidebar is called Outline. Heading, Paragraph, and Sentence options can be selected.

The right sidebar is called Word Finder; Word Finder has the following features: Definitions, Phonetic Search, and Meaning Search.

Pick one of the word processing assignments that we used previously. Practice proofreading the text that you have written using both the Natural and Detailed setting options.

# Markdown

**Heading**

# <space> Heading Level 1

# <space> Heading Level 2

# <space> Heading Level 3

**Emphasis**

Italic: \*italic\*

Bold: \*\*bold\*\*

**Numbered Lists**

Lists can be nested several levels deep, such as \*\*, or 1.1.

1. <space> First Item
2. <space> Second Item
3. <space> Third Item

**Bulleted Lists** \*, -, or +

* <space> First Item
* <space> Second Item
* <space> Third Item

**Page Break:** +++ on an empty line

**Links**

Links are created by surrounding the link text in square brackets, followed immediately by the URL in parenthesis. A label of the link is necessary as it will just say “Text to Link”

[text to link]([www.google.com](http://www.google.com/))

## Activity 8: Printing

Have a document that you have been working on open. Navigate to File and select Print. Go to the following web site for a list of AirPrint enabled printers and support information if needed: <http://support.apple.com/kb/HT4356>

# Google Drive

If a school district has implemented the Google environment the blind or low vision student requires access to this content. The G Suite iPad apps are one way for blind or low vision students to access this content using speech and/or Braille.

The Google Docs, Google Sheets, Google Slides, and Google Drive iPad apps should be installed. Folders can be created in Google Drive using the app. When work is created in Google Docs it is saved at the root directory in Google Drive. The student then goes into Google Drive and moves the file to the appropriate folder.

It is useful in Google Drive or any app to move quickly to the top or the bottom.

Gestures: Four finger tap near the top or the bottom of the screen

Bluetooth Keyboard: Control+Up Arrow or Control+Down Arrow

Braille Keyboard: Space+1-2-3 or Space+4-5-6

# 

# Keynote

* Keynote has a Menu Bar, an Add New Slide button, and two views: a thumbnail view and a slide view
* The user moves between the slides by selecting the desired thumbnail view with a VO+Spacebar and then moving to it.
* The user rearranges slides by double tapping on the desired thumbnail view twice with one finger, holding, and then moving the slide up or down.
* The Preview Animation view is accessible. The student should use a Braille display when giving the presentation and turn off the speech.
* The student needs to be instructed that only a limited amount of information can be placed on each slide. It is very helpful to make Braille notecards at the same time as the student is entering the information in Keynote.
* By default, an image is usually inserted with the first slide. This image can be deleted if desired by hovering around the image until an “Image Handle” is located. The user then does a VO+I and navigates to the Delete button.
* There will be discussion on what are the best types of slides are to use; my current suggestions are: Title and Subtitle, Title and Bullets, and Bullets.

Create a Sample Keynote Presentation on Russia

* Go to Presentations and select “Add Presentation”
* Enter the following information: ***Russia in Transition***
* Enter VO+Right Arrow to move to the subtitle. ***“Enter Your Name”***
* Do not number the slides on the Braille notecards at this time as you may be rearranging them. Braille number them when your presentation is finished. Consider Braille notecards
* Enter VO+Right Arrow and move to add a new slide, select the slide that says “Title and Bullets. Heading: ***Drainage*** Body Text: ***The Volga is the longest river in Europe. The Don flows southward into the Caspian Sea and then the Black Sea. The Moscow River flows through the capital.***
* Enter VO+Right Arrow and move to add a new slide, select “Title and Bullets.
* Next Slide: Heading: ***Kremlin*** Body Text: ***The Kremlin is one of the most significant places in Russia. The Kremlin was the formal seat of the former Soviet Union.***
* Next Slide: Heading: ***Vegetation*** Body Text: ***The Russian landmass can be divided into three strips. The northern most layer of Russia is known as the Tundra. The second band consists of thick forests.***

# Calendar

## Notes

Individuals may find the calendar to be easier to use on an iPhone or iTouch. *VO Calendar*, available from the App store, is designed to specifically work with VoiceOver.

Set the Calendar to **Days**

*Moving Forward or Backward Through Weeks*

Bluetooth Keyboard: Alt+Left or Right Arrow

Gesture: Three finger flick moving left or right

Braille Keyboard: O-Chord moving to the right, OW-Chord moving to the left

Useful Braille Commands

1-2-3+Space: Top of document

4-5-6+Space: Bottom of document

4-6+Space: Select (or Joystick if available)

4+Space: Move forward through days

1+Space: Move backward through days

## Activity 9: Using the Calendar

Practice entering the following appointments in the Calendar.

When making large jumps, such as navigating forward several months, first switch to navigate by months, and then change the View to Days so that appointments can be selected.

03-14: Shamrock Run

06-05: Starlight Run

06-17: Summer Vacation Starts

07-27: San Francisco Marathon

08-10: Dentist

10-04: Running Shoe Clinic

10-05: Portland Marathon

# Dictionary

Go to the iTunes store and download several of the free Dictionary apps. Practice using these apps with VoiceOver and a Braille display. It is hard to say which dictionary app is best at any given time. Some students just ask SIRI for the definition of a word, and how to spell the word.

# Contacts

The Contacts app is very accessible. Practice inserting a few contacts.

If you are using the iPad with an elementary student, I would suggest putting just a few contacts in, so it is much easier for the student to navigate. If these individuals have different first names so much the better.

The e-mail address of the student’s classroom teachers should be inserted in Contacts, so that they can easily accessed in Pages.

# Safari

## Reader

**Always use the Reader when VoiceOver says, “Reader Available.”** Navigate to the first button at the top of the screen, and then move to the Reader. Always look for web sites that support the Reader.

Quick Nav is turned on and off by pressing the left and right arrow keys at the same time. Enter a Control+Up Arrow, a Four Finger Tap, or a 1-2-3+Space to move to the first button on the screen, and then navigate to the Reader. Quick Nav needs to be **on** for Control+Up Arrow to work.

## Quick Keys

Enter VO+Q to turn on Quick Keys. Enter VO+Q again to turn Quick Keys off.

Press the left arrow and up arrow or the right arrow and up arrow *at the same time* to select an item on the rotor such as headings, links, form controls, etc. Then use the up arrow or the down arrow to navigate through the selected HTML element.

Hold the shift key down to navigate backward using the Quick Keys. If you want to use Copy and Paste, make sure that the Rotor is set to Edit.

B: Button

C: Form Control

H: Next heading

1-6: Next respective heading level

I: Next image

L: Next link

M: Next element of the same type

R: Next text field

S: Static Text

T: Next table

W: Next landmark

Shift: Previous Item

## Navigation & Reading Commands

VO-A: Read All

VO-B: Read from selected item

VO-F: Find

VO-G: Next search

VO-I: Item Chooser

## Gestures

Practice using the Rotor to navigate the web. Change the settings to Headings and then flick up and down through a web page. Use VO-Arrow Keys to read the content below the heading. Or use a Braille keyboard with a Dot-4 Chord to read the content below the heading. Or better yet use a quick flick down with two fingers (Gesture) to start reading at this point. Press twice with two fingers to stop.

## Copying Text from Safari to Pages

* Have Pages and Safari open before you start
* Go to Safari and open a Wikipedia article on something like “Lions, Tigers, Bears.”
* Move to the text in this article, or go to the Reader
* Use the Rotor and change the setting to Lines
* Use the “Pinch” movement and begin selecting text
* You can either use a “single flick down” to select text or CMD+C
* Check to see if Edit is present in the Rotor, if it is you have selected text
* Text can also be selected from the Braille keyboard with a Dots-2-5-6+Space command
* Go to Pages with either a CMD+Tab or a CMD+Shift+Tab
* Open a new document and enter a CMD+V to paste the text that you have just selected
* To copy text within Pages just use the navigation keys and the shift key; for example, Option+Shift+Left or Right Arrow

*McDonalds Online Menu*

The McDonalds Online Menu is very well designed and accessible.

Before starting this lesson, students should know how to move to the top of a web page with Control-Up Arrow and bottom of a web page with Control-Down Arrow. It is possible that this command will not work, if these commands do not work press the Left and Right Arrow key together to change the status of Quick Nav.

Students should be competent in moving backward through web pages using Control-Up Arrow and then entering VO-Right Arrow once to navigate to the back button, then VO-Spacebar.

Students should also be competent in basic navigation using VO-Left Arrow, VO-Right Arrow, and VO-Spacebar.

* Go to the McDonalds Online Menu, this web page is very well designed and very accessible.
* Enter VO-Right arrow until you are on “Skip to Main Content.”
* Press VO-Spacebar.
* Use VO-Right Arrow to navigate through the sub-headings and select one with VO-Spacebar.
* Enter VO-Q to turn on “Single Letter Quick Nav.”
* Press the letter “H” to go to the heading of the selected food item category.
* Press VO-Right Arrow to navigate through the food items and select one with VO-Spacebar.
* When a food item is selected, such as Egg McMuffin, the focus will land on “Skip to Main Content.” Select it and the focus will move directly to the item description. Navigate through the item description with VO-Right Arrow or VO-Left Arrow.
* When done Enter Ctrl-Up Arrow to go the top of the web page. Enter VO-Right Arrow once to go to back button and select it to begin another food search.

# Zoom

## Zoom Features

* Zoom, magnifies the entire screen, double tap with three fingers
* Follow Focus
* Smart Typing
* Keyboard Shortcuts
* Zoom Controller, useful for selecting Filters, turning off Inverted when wanting to see pictures for example, I would suggest selecting Smart Invert
* Zoom Region: Full Screen Zoom or Window Zoom
* Zoom Filter: None, Inverted, Grayscale, Grayscale Inverted, and Low Light
* Maximum Zoom Level, Adjustable
* An external keyboard is very useful for low vision students.
* One excellent use of an iPad is to receive information that is sent from the classroom teacher’s whiteboard or document station. The applications that I am aware are Air Display, Doceri, JoinMe, ScreenStream, and Splashtop. IT support is usually aware of more and has preferences.
* Settings\Accessibility: To start Zoom double-tap with three fingers
* Use three fingers to move around the screen while Zoom is on
* To change the Zoom magnification size double-tap with three fingers and move up or down
* Standard magnification, not part of Zoom is to flick two fingers apart in apps that support this

## Display & Text Size

* Bold Text
* Larger Text
* Button Shapes
* On/Off Labels
* Reduce Transparency
* Increase Contrast
* Differentiate Without Color
* Smart Invert
* Classic Invert
* Color Filters
* Reduce White Point
* Auto-Brightness

## Zoom Controller

Some students due to light sensitivity prefer black on white text, but do not want this feature on when they are looking at pictures. Enable the “Show Controller” feature in Zoom and select one of the filters. Go into a word processor such as Pages, select the Controller, select Choose Filter, then select Inverted. Or use Voice Dream Writer which has this feature.

## Activity 10

Open Pages on your iPad with Zoom turned on and begin writing Sample Letter 2, located at the end of this document. It is possible to print from Pages to printers that report Airprint, go to the Apple site to find out the current ones. Web pages can also be printed. Practice going on the Internet with Zoom on if there is time. Adjust the size of the Zoom.

Go into Zoom and practice the following options:

* Basic Zoom tap with three fingers to turn on, then three fingers to move around the screen
* Zoom controller to access Zoom Controls
* Zoom Region, both Full Screen Zoom and Window Zoom
* Maximum Zoom Level
* Filters

## Word Processing Skills

* Using a Bluetooth keyboard
* Renaming a file
* Using the spelling checker
* Using Zoom
* Printing

# 

# Apps for Students with Complex Learning Needs

A list of iPad apps accessible for blind and low vision students with complex learning needs is maintained at the following site: <https://www.wssb.wa.gov/services/statewide-technology-services>

Navigate to the “Educational iPad Apps for Preschool and Early Elementary Totally Blind Children” heading.

# Spanish Language

## Configuring

* Go to VoiceOver
* Go to Speech
* Select Add New Language, such as Spanish (Spain)
* Next go to VoiceOver, located in Accessibility
* Your new language should have automatically been placed in the Rotor, if not place it there.
* When Español is selected the Spanish Braille table is active
* Note: When any language is selected the Braille table for that language is active
* Use the Rotor to switch back to English when desired
* Enter a G+Chord until Braille output six dot is selected, if this is not the default.

## Entering Spanish Language Characters from a Braille Keyboard

Spanish characters can be entered from the on-screen keyboard, a Bluetooth keyboard, or a Braille keyboard. A really awesome list of shortcuts: <http://grannyjoans.blogspot.com/2011/05/bluetooth-keyboard-shortcuts-that-work.html>

(Even if you are not using the on-screen keyboard the Spanish keyboard needs to be active.)

* 1-2-3-5-6: á, a acute, mártir
* 2-3-4-6: é, e acute, por qué
* 3-4: í, i acute, adíos
* 3-4-6: ó, o acute, propósito
* 2-3-4-5-6: ú, u acute, único
* 1-2-4-5-6: ñ, n with tilde, mañana
* 1-2-5-6: ü, u with diaeresis, ungüento
* 2-6: ¿ Opening question mark
* 2-3-5: ¡ Opening exclamation point
* 3-6 3-6: Opening conversation sign

## Entering Spanish Language Characters from a Bluetooth Keyboard

Timing is important on entering these characters. For example, enter Option+u, release and then press the letter u by itself.

* Option e a: á, a acute, mártir
* Option e e: é, e acute, por qué
* Option e i: í, i acute, adíos
* Option e o: ó, o acute, propósito
* Option e u: ú, u acute, único
* Option n: ñ, n with tilde, mañana
* Option u u : ü, u with diaeresis, ungüento
* Option+shift /: ¿ Opening question mark
* Option 1 ¡ Opening exclamation point

# Talking Scientific Calculator

Talking Scientific Calculator is completely accessible for low vision and blind students. All of the numbers can be entered from either a Bluetooth or Braille keyboard. All of the functions in the calculator can be easily navigated by first letter from either the Bluetooth or Braille display. The functions are selected with the spacebar. The Braille display needs to be set at 8 dot uncontracted Braille. The keyboard needs to be turned on, located in Help

Talking Scientific Calculator is a very powerful, full featured calculator; to use this calculator proficiently it is necessary to go to Help on the product and read the manual.

**Bluetooth Keyboard Commands**

* Clear calculator: Opt+C
* Delete: Backspace
* Switch to Standard Mode: Opt+S
* Switch to Formula Mode: Opt+F
* Switch to Radians Trigonometric Mode: Opt+R
* Switch to Degrees Trigonometric Mode: Opt+D
* Toggle between Hexadecimal and Decimal Modes: Opt+H
* Toggle between Arc and Non-Arc Modes: Opt+A
* Read Answer Again: Spacebar, if the focus is not there Control-Up Arrow (Make sure Quick Nav is on)

**Talking Scientific Calculator Features**

* Talk or silent option
* Low or High contrast
* Standard or Formula mode
* Decimal or Hexadecimal modes
* Degrees/Radians/Gradians
* Your own voice can be recorded
* Extensive support for VoiceOver
* Bluetooth and Braille display support

# iPad Reference

Purchase a Bluetooth keyboard with a distinct on/off switch. Purchase a Braille display, a 40 cell Braille display if possible.

1. Turn on Bluetooth and connect the wireless keyboard
2. Go to Accessibility, located under General and go to VoiceOver
3. Turn on the Braille display and select choose a Braille device
4. Always Keep Voiceover on or Always Have the Braille display on Before You Start Voiceover.
5. Turn on contracted Braille, adjust typing feedback as desired
6. Note that new Braille displays are connected in Bluetooth.

## Connecting Braille Displays

### General Rules

1. iOS does not have Braille legacy commands in word processors such as Pages. The cursor routing keys work well.
2. Only one Bluetooth Braille display can be connected at a time.
3. Make sure that you have the latest firmware in your Braille display
4. If VoiceOver does not find the Braille display, go into VoiceOver and connect the same Braille display again.
5. If it still does not connect, forget the Braille display, and reconnect again!
6. Still does not connect, do a Shutdown on the iPad and try again.

### Braille Display Passcodes

1. Bluetooth needs to be turned on.
2. The passcode must be entered quickly, within 10 seconds.
3. The code must be entered quickly, within 10 seconds.
4. Most likely the passcode will either be 1234 or 0000. On the BrailleNote Apex the passcode is 0000.

### APH Chameleon 20 and APH Mantis Q40

Both devices work very well with the iPad. The connection is completed in Bluetooth, not in VoiceOver.

iOS 15.x or later is required when connecting the APH Chameleon 20 to an iPad. Current iOS version is 16.x. The latest APH Chameleon 20 firmware is also required, currently 2.x. These instructions work best with VoiceOver running.

1. iOS 15.x or later is required. The unit will not stay connected with earlier versions.
2. Do the following only if you are having difficulty connecting your device.
3. Delete all Bluetooth devices connected on the iPad.
4. Go to Settings, then Bluetooth on the APH Chameleon 20 Braille Display. Note that this device is first paired in Bluetooth, not VoiceOver.
5. Delete all paired devices.
6. Shut down the APH Chameleon 20 Braille Display and the iPad. Restart.
7. Go to Terminal on the Chameleon.
8. Go to Bluetooth settings in Terminal. Select Add Bluetooth Device.
9. The device will say “Activate Your Device in Your Host Computer.”
10. Check in the iPad in Settings, then Bluetooth that the device has connected.
11. Go to Terminal, then Connected Devices on your Chameleon. Select the name of the iPad that you connected to.
12. Open this connection and navigate until it says Brl Display on the Braille Display. With VoiceOver running use Gestures to send initial data from the iPad to the APH Chameleon 20.

Known Problem: Accessibility, then Keyboards, Full Access Keyboard must be Off

## VoiceOver Braille Settings

1. Go to Accessibility, then VoiceOver
2. Go to Braille
3. Set Output and Input to Contracted Braille
4. Check APH Chameleon 20 is selected as a Braille Display, if not select it.

# Braille Keyboard Commands

**General**

Dots-2-3-4+Space: Activates the **S**tatus bar

Dots-1-2-5+Space: Activates the **H**ome button

Dots-1-2-4-5+Space: Switches between contracted and uncontracted Braille **G**

Dots-2-3+Space: Navigate Rotor forward

Dots-5-6+Space: Navigate Rotor backward

Dots-1-2-3-4-5-6+Space: Screen curtain (toggle)

Dots-1-2+Space: Activates the **B**ack button

Dots-1-5+Space: Activates the return key **E**

Dot-8+Space: Activates the return key

Dot-7+Space: Activates the delete key

**Basic Navigation**

Dot-1+Space: Move to previous item

Dot-4+Space: Move to next item

Dot-2+Space: Pan Braille to the left

Dot-5+Space: Pan Braille to the right

Dot-3+Space: Move to the previous rotor setting

Dot-6+Space: Move to the next rotor setting

Dots-1-2-3+Space: Move to the first element

Dots-4-5-6+Space: Move to the last element

Dots-1-4-6+Space: Show/hide keyboard

**Reading**

Dots-1-2-3-5+Space: **R**ead page starting at selected item

Dots-2-4-5-6+Space: Read page starting at the top **W**

Dots-1-2-3-4+Space: **P**ause or continue speech

**Select Text**

Dots-2-3-5-6+Space: Select All

Dots-2-5-6+Space: Select text forward from insertion point

Dots-2-3-5+Space: Deselect text

Dots-1-4+Space: **C**opy

Dots-1-3-4-6+Space: Cut

Dots-1-2-3-6+Space: Paste **V**

## iPad Checklist

Student's Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Files

Create a file: \_\_\_\_\_\_\_\_\_\_

Open a file: \_\_\_\_\_\_\_\_\_\_

Delete file: \_\_\_\_\_\_\_\_\_\_

Share with Cloud Service: \_\_\_\_\_\_\_\_\_\_

Print: \_\_\_\_\_\_\_\_\_\_

## Delete Commands

Delete characters: \_\_\_\_\_\_\_\_\_\_

Delete words: \_\_\_\_\_\_\_\_\_\_

Delete lines: \_\_\_\_\_\_\_\_\_\_

Delete all: \_\_\_\_\_\_\_\_\_\_

## Cursor Movement

Move to the beginning of the file: \_\_\_\_\_\_\_\_\_\_

Move to the end of the file: \_\_\_\_\_\_\_\_\_\_

Move forward one sentence at a time: \_\_\_\_\_\_\_\_\_\_

Move backward one sentence at a time: \_\_\_\_\_\_\_\_\_\_

Move forward one word at a time: \_\_\_\_\_\_\_\_\_\_

Move backward one word at a time: \_\_\_\_\_\_\_\_\_\_

Move forward one character at a time: \_\_\_\_\_\_\_\_\_\_

Move backward one character at a time: \_\_\_\_\_\_\_\_\_

Read current word: \_\_\_\_\_\_\_\_\_

Spell current word: \_\_\_\_\_\_\_\_\_

Read entire document: \_\_\_\_\_\_\_\_\_\_

## General

Able to use the Spelling Checker: \_\_\_\_\_\_\_\_\_

Able to use the Calculator: \_\_\_\_\_\_\_\_\_

Able to use the Calendar: \_\_\_\_\_\_\_\_\_

## Change Voice

Louder/Softer: \_\_\_\_\_\_\_\_\_\_

Faster/Slower: \_\_\_\_\_\_\_\_\_\_

Higher/Lower: \_\_\_\_\_\_\_\_\_\_

## Copy & Paste Commands

Able to delete blocks of text: \_\_\_\_\_\_\_\_\_

Able to copy blocks of text: \_\_\_\_\_\_\_\_\_

Able to paste blocks of text: \_\_\_\_\_\_\_\_\_

## Internet Access

Able to open a URL: \_\_\_\_\_\_\_\_\_\_

Able to move through links: \_\_\_\_\_\_\_\_\_\_

Able to first letter navigation commands: \_\_\_\_\_\_\_\_\_\_

Read web pages: \_\_\_\_\_\_\_\_\_\_

Able to go forward and backward by pages: \_\_\_\_\_\_\_\_\_\_

Able to use gestures: \_\_\_\_\_\_\_\_\_\_

Use Reader\_\_\_\_\_\_\_\_\_\_

## Sample Letter 1: Physical

2214 E. 13th Street

Vancouver, WA 98661

Date

Dear Pat:

This letter is a response to your question on providing computer access to a learning-disabled student with a physical handicap.

The APPlicator device from Inclusive Technologies is an excellent switch access device. It is sold by Inclusive Technologies. <https://www.inclusivetlc.com/applicator>

Scanning is a useful method for a student who can depress one or possibly two switches.

Sincerely,

Your Name

## Sample Letter 2: Spelling Checker

Keyboard or Braille this letter with the misspelled words! Use the spelling checker with this document.

2214 E. 13th Street

Vancouver, WA 98661

Date

Pat Smith

122 Main

Gettysburg, PA

Dear Pat,

I wass so delighted to hear that you have moved to **Gettysburg**. From your last letterr you informed me that you are now studing the role that cavalry played in the battle and wished to discusss the following points.

1. What *impat* did Brandy Station have on Jeb Stuart’s future actionns?
2. Was it truee that Brandy Station “**made**” the Union cavalry? Do you aggree with this statement?
3. Howw *importannt* was Buford’s role on the firrst day?

Looking forrward to talking to you sooon.

Sincerely,

Your Name

# Appendix A: Bluetooth Keyboards

The Apple Wireless keyboard has an Escape key. A chargeable Logitech keyboard that works with both the Mac and the iPad is also an excellent choice.

The Control and Option keys should be next to each other on the bottom left corner of the keyboard.

It is useful to have a Show/Hide keyboard key in case the student will need to access the on-screen keyboard to use the dictation microphone.

Many keyboards designed specifically for the iPad/iPhone/iTouch do not have an Escape key; they have a Home key instead.

You may be able to find a keyboard that has a Function+Escape key.

It is necessary when using keyboards without an Escape key to exit dialog boxes either using a Braille display or by touch on the iPad. When exiting by touch the user determines where the dialog box is not located and then double-taps on that position to close the dialog box.

To close a dialog box with a Braille display, enter a Dots-1+2 space. (B-Chord)

## Large Print iPad Keyboards

Large keyboards are available for the iPad, but the vendors that manufacture these devices change frequently. Do a Google search, the Clevy keyboard seems to be the current available keyboard.

# Appendix B: iPad Apps from APH

## Visual Brailler

Visual Brailler is a simple Braille editor from APH for the iPad, available in the App store. Visual Brailler is free and requires iOS 7 or later. Visual Brailler displays a six-dot keyboard and simulated Braille on the screen. Files can be shared with Visual Brailler; it supports BRL and BRF Braille file export.

### Using Visual Brailler with VoiceOver and Braille Displays

* Turn Braille translation off: G-Chord, this command is a toggle
* Turn speech off when editing, the only thing Visual Brailler says in the editing screen is that the dots are unpronounceable, tap with three fingers twice
* Review the Braille by using the cursor routing keys
* The Braille can also be reviewed by using the Dot+3 key to go back or the Dot+6 key to go forward, the user will need to use the Rotor to change the function of these keys to either Lines or Characters, the Word option does not currently seem to work

## Math Robot App for the iPad

Math Robot is an iPad app from APH that provides drill and practice for simple math programs. It is completely accessible with VoiceOver and with Braille displays. To answer the questions using the Braille display it is necessary to turn contractions off:

G-Chord, this command is a toggle.

## Talking Typer

Talking Typer, keyboarding app for the iPad from APH. If it is not working change the status of Quick Nav, press the Left and Right arrow keys together.

## Nearby Explorer

Orientation and Mobility app

## Slapstick Math

Free iOS math app from APH

## Complete List of APH Apps

<https://www.aph.org/free-apps-from-aph/>

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Session\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Activity 1: \_\_\_\_\_\_\_\_

Activity 2: \_\_\_\_\_\_\_\_

Activity 3: \_\_\_\_\_\_\_\_

Activity 4: \_\_\_\_\_\_\_\_

Activity 5: \_\_\_\_\_\_\_\_

Activity 6: \_\_\_\_\_\_\_\_

Activity 7: \_\_\_\_\_\_\_\_

Activity 8: \_\_\_\_\_\_\_\_

Activity 9: \_\_\_\_\_\_\_\_

Activity 10: \_\_\_\_\_\_\_