# Accessibility in the Chromebook

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**IT Support**

Frequently teachers of the visually impaired need the latest Chrome updates for their students, and IT may be reluctant to do this, usually because they are unsure if the latest update will work with the SBAC yet. Frequently TVI’s want Android apps on their student’s Chromebooks. And TVI’s never want the accessibility features disabled on their student’s Chromebooks.

IT professionals can provide a solution. They place all the visually impaired students in their school district in an “Organizational Unit” and give the visually impaired students the rights that they need, such as the ability to put Android apps on a Chromebook. I even saw an “Organizational Unit” created for one visually impaired student in a small district.

**Voice Typing**

Try any of the writing assignments in this document with Voice Typing. Appendix I lists the most frequently used Voice Typing commands. It also has a link to a document from Google listing all the Voice Typing commands. The student should wear earphones with a microphone if they are using ChromeVox with Voice Typing. Lists of Voice Typing commands, useful for IEP goals is on the WSSB Statewide Technology web page in Braille and print.

**Previous Webpage/Next Webpage**

The Previous Webpage and Next Webpage, left and right Arrow on the top row are very useful when using ChromeVox, especially when used in conjunction with the Control key. Chromebooks have a Search key where you would expect to find the Caps Lock key. The Search key is essential to ChromeVox and is called the ChromeVox key. No Caps Lock key on a Chromebook? Alt+Search is the toggle for Caps Lock. When screen magnifier is turned on Control+Alt+Brightness Down will decrease screen enlargement and Control+Alt+Brightness Up will increase screen enlargement. Ctrl+Alt+Arrow Keys will pan the enlarged screen.

**Google Forms**

Some materials that visually impaired students are asked to use are inaccessible. TVI’s can use Google Forms to develop accessible materials. Google Forms can also be used to develop switch accessible materials.

# Class Objectives

1. \_\_\_\_ Able to use a keyboarding program.
2. \_\_\_\_ Able to demonstrate basic Chromebook concepts/commands.
3. \_\_\_\_ Able to demonstrate advanced Chromebook keyboard commands.
4. \_\_\_\_ Able to demonstrate basic Google Docs keystrokes.
5. \_\_\_\_ Able to use Google Docs with a QWERTY Braille display
6. \_\_\_\_ Able to configure the Chromebook for low vision students.
7. \_\_\_\_ Understand how OCR works with Google Docs.
8. \_\_\_\_ Able to format documents correctly with Google Docs.
9. \_\_\_\_ Able to use the spelling checker with Google Docs.
10. \_\_\_\_ Able to access on-line resources with ChromeVox.
11. \_\_\_\_ Able to use Define & Explore in Google Docs with ChromeVox.
12. \_\_\_\_ Able to access information on the web on a basic level.
13. \_\_\_\_ Able to access information on the web on an advanced level.
14. \_\_\_\_ Able to access Google Classroom materials.
15. \_\_\_\_ Able to create Slides presentations with ChromeVox.
16. \_\_\_\_ Able to use a Reading app such as Dolphin Easy Reader

## Find Command

* Use the Find command as soon as possible: Ctrl+F
* Ctrl+F, text string, escape
* This command is useful for locating files, finding information in webpages, in Google Docs, and more.
* The pace in the Google classrooms moves very fast, request that all the student’s classroom teachers give each assignment a unique filename, some teachers also add the date to the filename as a four-digit number, for example 0318. Helps with searching.

# Teaching the Keyboard

[TypingClub](https://www.typingclub.com/) provides a universally designed online curriculum to teach touch typing in grades K-12. This accessible online program is used by many public-school districts and is available across all operating systems. The activities in TypingClub are self-voicing, but have ChromeVox on when teaching it, when navigation in TypingClub starts ChromeVox takes over, a great opportunity to introduce the commands ChromeVox+Left Arrow, ChromeVox+Right Arrow, and ChomeVox+Spacebar.

TypingClub is accessible for low vision and blind students, students with dyslexia, physically handicapped students, and deaf and hard of hearing students. Information on TypingClub accessibility and features: <https://www.wssb.wa.gov/services/statewide-technology-services>

## Keyboarding Programs Specific for the Visually Impaired

APH produces a keyboarding program called [Talking Typer.](http://tech.aph.org/tt_info.htm) This keyboarding program is available in Windows and iOS. APH also produces Typer Online.

Another accessible program for students is Talking Typing Teacher. This product is sold by various companies. Windows only.

[Typeability](http://www.yesaccessible.com/typeability.html)  is another accessible keyboarding program; this program is designed for students who will be using JAWS. Windows only.

The fourth accessible keyboarding program is [Typio.](https://www.accessibyte.com/typio/) Typio has developed online cloud based software that enables the student to log in from anywhere and use any device. Typio is a customizable and interactive typing tutor. Typio has a Windows version.

**Top Row**

Key 1: Escape

Key 2: Left arrow, goes to previous page in your browser history

Key 3: Right arrow, goes to the next page in your browser history

Key 4: Reloads your current page

Key 5: Opens your page in full-screen mode

Key 6: Switch to your next window

Key 7: Decrease screen brightness

Key 8: Increase screen brightness

Key 9: Mute

Key 10: Decrease system volume

Key 11: Increase system volume

Key 12: Lock

# ChromeVox Resources

1. Google AFB 2016 Train the Trainer: <https://sites.google.com/site/afbttt2016/>
2. ChromeVox User Guide: <http://www.chromevox.com/index.html>
3. ChromeVox Tutorial: <http://www.chromevox.com/tutorial/>
4. [Video Introducing the ChromeVox Screen Reader](https://www.youtube.com/watch?v=NyuuK7tB9fM&index=12&list=PL5aqr5w5fRe7QWzXhqxrilIVduWEmLHM2)
5. [Using the ChromeVox on your Chromebook: Fundamentals Video](https://www.youtube.com/watch?v=fpbIsN31hLM)
6. [Using the ChromeVox on your Chromebook: Intermediate Video](https://www.youtube.com/watch?v=0jPpJEsM5TE)
7. Chromebook Help Center: <https://support.google.com/chromebook/answer/7031755?hl=en>
8. Chromebook Keyboard Shortcuts: <https://support.google.com/chromebook/answer/183101?hl=en>
9. Bridges Blog Chromebook Switch Access 1: <https://bridgesontario.wordpress.com/2015/09/22/chromebooks-and-switch-access/>
10. Bridges Blog Chromebook Switch Access 2: <https://bridgesontario.wordpress.com/2015/09/28/top-8-chromebook-simple-switch-activity-sites/>
11. WSSB Resources: <https://www.wssb.wa.gov/services/statewide-technology-services>
12. Voice Typing in Google Docs: <https://support.google.com/docs/answer/4492226?hl=en>
13. Accessibility for Google Docs Editors:
<https://support.google.com/docs/answer/6282736?co=GENIE.Platform%3DAndroid&hl=en>
14. Formatting Google Docs for Accessibility:
<https://support.google.com/docs/answer/6199477?hl=en>
15. Wisconsin Center for the Blind and Visually Impaired, Amy Snow: [ChromeVox Slide Decks Weeks 1-6](https://drive.google.com/drive/folders/1n9l4yZLDl6-8P528oOpu9kjzgHpsE8G7?usp=sharing)
16. <http://apps4android.org/chromevox/>
17. CTRL+ALT+/: Displays a list of all Chromebook keystrokes

# Low Vision Access

Purchase a 15.6-inch touchscreen Chromebook or possibly a 17.3-inch Chromebook, IT departments usually have a specific brand of Chromebook that they wish to purchase.

A USB 3.1 port is required for the Enhanced Vision/Low Vision International video magnifiers.

## Accessibility Settings

1. Open the System Tray in the lower right corner of the Chromebook
2. Click on “*Show Advanced Settings*”
3. Go to the Accessibility settings and check “*Show accessibility options in the system menu.”*
4. Select “*Manage accessibility features*”
5. **Display**
*Use high contrast mode*
*Enable screen magnifier*
*Open display device settings*, this setting allows you to change your screen resolution
*Open appearance settings*, this setting allows you to customize your text size
6. **Keyboard***Highlight the object with keyboard focus when it changes
Highlight the text caret when it appears or moves*
7. **Mouse***Show large mouse cursor*
*Highlight the mouse cursor when it is moving
Mouse Color: 8 options*

## Keystrokes

1. Screen magnifier: Ctrl+Alt+BrightnessUP or Ctrl+Alt+BrightnessDown
2. Zoom: Ctrl+ or Ctrl-
3. Screen Resolution: Ctrl+Alt+ or Ctrl+Alt- (I would suggest determining the best resolution setting is for your device before using this command.)
4. Ctrl+Shift+X is the Context keystroke, ChromeVox use ChromeVox+M

## Connecting a Chromebook to a Larger Monitor

A Chromebook can be connected to an external (larger) monitor using the HDMI port, or if the Chromebook does not have an HDMI port an adapter can be purchased. If this option is selected you may want to purchase a ChromeBox instead of a Chromebook, the student would then need a Chrome external keyboard, Logitech makes one, possibly others. Or maybe even a Chromebit (USB size unit) connected to an HDMI port on a large monitor.

## Chromebook User Interface Keystrokes

* Toolbar: Alt+Shift+T
* Bookmarks: Alt+Shift+B
* Launcher: Alt+Shift+L
* Status Tray: Alt+Shift+S
* Notifications: Alt+Shift+N

Google extensions useful for low vision students:

* Share to Classroom: This Google extension allows you to push webpages onto any of your classroom computers
* Splashtop Classroom: Google extension screen sharing
* CrankWheel: Screen sharing extension
* Many other screen sharing applications, check with IT for the one they prefer
* Read&Write from TextHelp is very useful for low vision adaptations; simplify web pages, changing backgrounds, spacing, fonts, font sizes, & speech output
* Screencastify: Record classroom presentations for low vision students

## Video Magnifiers

IPEVO: <https://www.ipevo.com/> I would suggest the wireless version, VZ-X. One classroom use is to place the IPEVO wireless camera right next to the classroom teacher’s document camera. Download the IPEVO Visualizer software. The iDocCam app from IPEVO is also available.

Magnilink S Premium 2: Download the ChromeViewer extension. Check with Low Vision International for current specs.

<https://lviamerica.com/catalog/products/magnilink-s-premium-2>

Transformer HD from Enhanced Vision. Download the Transformer HD extension. Check with Enhanced Vision for current specs. <https://www.enhancedvision.com/low-vision-product-line/transformer-hd-portable-electronic-magnifier.html>

Some Video Magnifiers can be used as an external display.

## Disabling the Touchpad on a Chromebook

Some touchpads are very sensitive and sometimes students really want to have them turned off when using a Chromebook. Tap to Click can be disabled in Settings, Device\Touchpad.

* Enter the following URL into your address bar on the Chromebook: chrome://flags/#ash-debug-shortcuts
* Enable “Debugging Keyboard Shortcuts”
* To toggle the touchpad off and on: Search+Shift+P
* Not working, tape a piece of cardboard over the touchpad

## Chromebook Specs

* Always have the latest system software on your Chromebook. The current version should be 109.x or later. I would suggest running on the beta channel.
* ChromeVox is turned on with Ctrl+Alt+Z. This command is a toggle.
* The Search key is the ChromeVox key, Control is the silence key.

## ChromeVox Tutorials

Tutorial: ChromeVox+O, T
To access all the tutorial materials have ChromeVox running and open [www.google.com](http://www.google.com), enter ChromeVox+. to open the ChromeVox Panel. Then use right arrow key to navigate to ChromeVox.

## Voices, Volume, Rate, and Pitch

* System volume is adjusted with the volume keys at the top of the keyboard, keys 9, 10, 11
* Rate is adjusted with ChromeVox+Left Bracket to increase and ChromeVox+Shift+Left Bracket to decrease
* Pitch is adjusted with ChromeVox+Right Bracket to increase and ChromeVox+Shift+Right Bracket to decrease
* Voices: Chrome OS US English 1 – 8 can be selected (Located in text to speech setting)

## Four Ways to Navigate

Students will use a combination of the following keystrokes for navigation.

* ChromeVox+Arrow keys
* Arrow keys
* Tab and Shift/Tab
* Ctrl+Previous Web Page (Back Arrow) or Next Web Page (Forward Arrow)

## Basic ChromeVox Navigation Keys

* Next Object: ChromeVox+Right Arrow
* Previous Object: ChromeVox+Left Arrow
* Next Group: ChromeVox+Ctrl+Down Arrow
* Previous Group: ChromeVox+Ctrl+Up Arrow
* Bottom of Document: ChromeVox+Ctrl+Right Arrow
* Top of Document: ChromeVox+Ctrl+Left Arrow
* Select: ChromeVox+Spacebar
* Context Menu: ChromeVox+M
* Start reading from current location: ChromeVox+R

# Chromebook Keyboard Navigation

## Frequently Used Keyboard Commands

* Ctrl+T: Opens a new tab
* Ctrl+Tab: Move forward between open tabs
* Ctrl+Shift+Tab: Moves backward between open tabs
* Ctrl+L: Moves the user to the Address Bar
* Ctrl+W: Closes open tab
* Alt+Left Bracket or Alt+Right Bracket: Split Screen

## Views Matter

Set View in Google Drive to List View, instead of Grid View. But some actions, such as moving files may currently work better in Grid View. The letter “V” changes views in Google Drive.

## Google Drive Does OCR!

* Use the school copier and scan a worksheet into the student’s Google Drive.
* Use the context command to select this image file, the ChromeVox keystroke is ChromeVox+M, then select “Open With:
* Select Google Docs and Google will OCR this file. The image will be at the top of the file and actionable text will be at the bottom.

## Creating a New File

Sighted instructors will take their students to Google Docs or Google Slides, have them use the mouse, and create a new document. It is easier for blind students to access everything, including creating new documents/folders through **Google Drive**.

Press C for New, then down arrow to the desired option. Enter.

Note that C creates a new message in GMail and a new event in Calendar.

**Even Faster**

New Document: Shift+T

New Folder: Shift+F

New Presentation: Shift+P

New Spreadsheet: Shift+S

# Google Drive

Note that Google commands begin with the letter G and then another letter.

Note that sometimes ChromeVox commands begin with the letter A or O and then
another letter.

Tree Items are opened and closed with the right and left arrow keys.

## Frequently Used Commands

* Navigate to the My Drive button
* Context Menu: ChromeVox+M
* Navigation Pane: gn
* List View: gl
* Go Up One Folder in the Path: gp
* Settings: t
* Search Drive: /
* Tree Item: Expand or collapse with the left or right arrow keys
* Clear Selected Text: Shift+N
* Create Folder: Shift+F (Or go to New button, then down arrow)
* Select the First Item in the List: Right Arrow

**? or Ctrl+/** will bring up a complete list of keyboard shortcuts in Google Drive.

You can use the Tab key to navigate in Google Drive, but it will be more keystrokes.

## Files and Folders

* Folders can be created C and, then navigation, or Shift+F. Have the students create folders that they would use in class; in this class I would suggest creating the following folders: Science, History, Social Studies, and Writing. I always suggest that students put the school year after the folder name.
* Navigate to one of these folders and open it.
* Press Shift+t to save a Google Doc in this folder location.
* ChromeVox+M is very useful for moving files.
* Delete files with the #
* Files can be saved as either a Google Doc or a Microsoft Word file. Then sent to a removable drive or emailed. Or Brailled when the file is saved in Microsoft Word format.

# Google DocsWriting Activities

## Google Docs Accessibility Features

* Go to Tools, then Accessibility
* Turn on Screen Reader Support
* Turn on Braille support even if you do not have a Braille display

Go into a blank Google document with ChromeVox on. Write a few words and then enter the keyboard echo command: ChromeVox+A, T. Switch to words and write a few words, switch to characters, and write a few words.

Braille support always needs to be turned on if you are using a Braille display.

Braille support should be turned on even if you are not using a Braille display, speech access generally works better. To see this, go into Accessibility and turn Braille support off. Enter a ChromeVox+A, T and keyboard echo will not work.

### Connecting a Braille Display

Connect a Braille display, USB only to the Chromebook. ChromeVox uses Brltty, a background process that drives the Braille display, this process does not support Bluetooth. Check to see that ChromeVox supports your Braille display, some Braille displays need to be placed in terminal mode to function. Turn on Braille captions with ChromeVox+A, B.

Enter ChromeVox+O, O to go to ChromeVox options. Select the desired Braille table.
Appendix H has a list of Braille display commands.

### Activity 1: Learning the Chrome Keystrokes

* Create a Google Docs file in Google Drive: Shift+T.
* Enter Alt+H, Help, then down arrow to Keyboard Shortcuts.
* The keyboard shortcut for Keyboard Shortcuts is Ctrl+/
* Use ChromeVox+Down or Up Arrow to navigate through this list.

### Comment

* Sometimes the cursor will not be in the Edit field. Hit any key to see if the focus back to the Edit field. If this does not work, then use ChromeVox+E or ChromeVox+Shift+E to navigate to “Document Content.” This can happen if the student is in a Sidebar and navigates away from it without closing it.
* Note that there are sometimes two keystrokes for the same action. The Context keystroke is ChromeVox+M, Ctrl+Shift+X will be used by low vision students.

### Activity 2

* Open the History folder and create this file there.
* The name of this file should be “Amana Colonies.” Rename this file after you have finished or while you are still working on it. Alt+F, then Rename. Make sure to hit <enter> after you rename the file to move the focus back to the editing field.
* Keyboard in the following information; please make many spelling errors as you do this.
* Set the keyboarding echo to your preference: ChromeVox+A, T, do this several times. You may need to move out of the editing field to use this command.
* Basic navigation: Ctrl+left arrow or right arrow.

### Correcting Spelling Errors

* Backward through the document with a Ctrl+; forward through the document with Ctrl+’
* ChromeVox will read the sentence and the focus will be placed on the misspelled word. If the focus is not directly on the misspelled word use the left or right arrow keys to move there.
* Use ChromeVox+M to open the Context Menu, and then the down arrow key to access the suggested replacements.
* The second method is to use the Spelling Checker, then down arrow to Spelling. Keystroke: Ctrl+Alt+X, this method does not give as much contextual information, but I always ask that students do this before they turn in their work.

## Basic Word Processing Navigation Keys

* Move forward or backward by words: Ctrl+Left or Right Arrow
* Move down or up through the document by groups: Ctrl+Up or Down Arrow
* Top or bottom of document: ChromeVox+Ctrl+Left or Right Arrow

Dear Pat,

It was good to hear from you again. Perhaps we could meet at the Drake Relays and then after that visit the Amana Colonies. I so love the food there, especially bratwurst. Fall is the best time for a visit to Iowa. I hope we do not have a tough winter this year, but occasionally we do. I should go now; I need to start working on my English report.

Sincerely,

Your Name

### Activity 3

Open the Writing folder and create this file there. Call this file Saturday Market. Please make many spelling errors as you produce this document. Heading 1: Ctrl+Alt+1.

**Saturday & Sunday Market**

Rain or shine, this eclectic outdoor market comes to life every Saturday and Sunday from March through December. Vendors sell unique gifts, exotic cuisines, and fresh fruits and vegetables.

The Portland Monday Market is in the shelter of the west end of the Burnside Bridge in Portland's Historic Old Town.

## Define

Select (highlight) a word in the document that you just created. Enter Ctrl+Shift+Y to access the dictionary. Enter either ChromeVox+Down Arrow or ChromeVox+R to read the definition. When done use ChromeVox+Up Arrow to navigate back to “Close Dictionary” checkbox. Can’t remember these keystrokes, use ChromeVox+M.

## Checklist

\_\_\_\_ Able to create work in a specified folder

\_\_\_\_ Able to go to the Navigation Pane and Items View

\_\_\_\_ Able to move up/down the folder path

\_\_\_\_ Able to rename files

\_\_\_\_ Able to use the spelling checker

\_\_\_\_ Able to use navigate to top and bottom of document

\_\_\_\_ Able to navigate through the document by words

\_\_\_\_ Able to navigate through the document by groups

\_\_\_\_ Able to copy and paste between documents

\_\_\_\_ Able to set the accessibility options

\_\_\_\_ Able to use the dictionary in Google Docs

# Collaborating

## Suggestions

* The classroom teacher reviewing the students work can select Editing, Suggesting, or Viewing.
* When the Suggesting option is selected, the suggestions are placed directly in the student’s document.
* I would recommend that the classroom teacher begin each suggestion with an asterisk and end the suggestion with an asterisk. Example: \*Provide more supporting detail in this document.\* Asterisks are great, because when moving through the document it is easy to miss ChromeVox saying, “Suggestion Start, Suggestion End.”
* The student can then place their cursor between the asterisks and make changes.
* When the cursor is between the asterisks the student would then enter Ctrl+Alt+E, C and accept or modify the changes as desired.
* However, if this was more of a general suggestion about the document, essentially a comment, the student would read the suggestion, place their cursor between the two asterisks, enter Ctrl+Alt+E, C then reject this suggestion to remove it from their document.
* Always complete an action when you are in Suggestions or Comments. Press Escape without completing an action and there might not be an active focus.

## Adding and Reading Comments

* Add a Comment: Ctrl+Alt+M
* Open Comment Thread: Ctrl+Alt+Shift+A
* Ctrl+Alt+E, C: Cursor needs to on where the comment was placed in the document.
* Navigate with the ChromeVox+Left or Right Arrow keys.
* But sometimes numerous comments coming from many of students in the class at the same time are very distracting, they can be turned off in Docs under Accessibility, then Settings.
* Ctrl+Alt+R will read if there are comments in the document, ChromeVox+R does not.
* ChromeVox reads alt+text on images. And AI is trying to figure out non-labeled images.

### Activity 4

Open the Saturday & Sunday Market file; make several suggestions/comments on this file. We may send this file later to students in this class. We will also be writing a file on the Maryhill Museum later in this document and making suggestions/comments on this file.

## Inserting and Deleting

### Activity 5

* Navigate to your History folder and enter Shift+t. Rename the document.
* Use the Ctrl+Left or Right arrow keys to navigate through the document.
* Use the Ctrl+Shift+Left or Right arrow keys to select.
* PageUp: Alt+Up Arrow
* PageDown: Alt+Down Arrow
* Before starting the list enter Alt-O, down arrow to List, right arrow, and then select a list. You could hit the letter “s” to get to the list style quickly.

### Formatting Commands

* Bold: Ctrl+B
* Underline: Ctrl+U
* Italic: Ctrl+I

Dear Pat,

1. Well, I am finally at Yorktown.
2. I am aware that you are interested in why General Washington chose not to attack New York, but Yorktown turned out to be the correct choice.
3. The role that the French army played under General Comte de Rochambeau was very important.
4. The route that the American and French soldiers travelled from Newport, Rhode Island to Yorktown, Virginia is now a National Historic Trail.
5. The French fleet defeating the British fleet at the Battle of the Chesapeake was very important to the American and French victory at Yorktown.
6. The British army surrendered on October 19, 1781 to American and French forces under General George Washington and General Comte de Rochambeau.

Sincerely,

Your Name

## Make the Following Changes to this Document

1. Sentence 2 change “interested in” to “intrigued by.”
2. Sentence 3 change “very important” to “critical.”
3. Sentence 4 change “travelled” to “marched.”
4. Sentence 5 change “very important” to “essential.”
5. Sentence 6 change “surrendered” to “capitulated.”

## Google Docs Heading Structure

* Create a new document in your Writing folder and call it Maryhill.
* This document will have three heading levels, use Ctrl+Alt+1, Ctrl+Alt+2, and Ctrl+Alt+3.
* You have created several documents, practice copying and pasting text between documents: use Ctrl+Tab or Ctrl+Shift+Tab to move backward.

### Activity 6

**Maryhill Museum of Art**

The Maryhill Museum of Art is a two-hour drive east of Portland. To get there take I-84 east to state highway 97 at Biggs. Maryhill is just across the Columbia River on the Washington side.

**History**

In 1907, Sam Hill bought 7,000 acres of land overlooking the Columbia River with the intention of establishing a Quaker agricultural community. Construction for his mansion started in 1914. When his venture failed to attract followers his own interest in living at Maryhill declined.

**The Permanent Collections**

***Rodin***

Auguste Rodin sculpture and drawings are an internationally recognized collection of work by the great French master.

***Native American Collection***

The extensive Native American Collection comprises rare prehistoric rock carvings, baskets, beadwork, and other objects which are both art and artifact.

***Queen Marie Gallery***

This exhibit recalls the Rumanian queen's celebrated association with Maryhill Museum. The exhibits include Queen Marie's gilt furniture, jewelry and memorabilia, and the gown she wore to the coronation of Tsar Nicholas II. The collection of Russian Icons contains gifts from Queen Marie.

***Chess Set***

The Chess Set Collection is a popular favorite which features over 100 antique and unusual sets from around the world.

# Navigating the Web

## Commands to Teach First When Using the Internet

* Find Command: Ctrl+F
* Move to the Address Bar: Ctrl+L
* Keyboard in the address of a website of your choice.
* Open the ChromeVox Panel: Chrome+. The ChromeVox Panel is very useful to determine if a website is accessible.
* Navigate through several websites of your choice using the ChromeVox Panel.
* Practice using left and right arrow keys at the top of the keyboard to navigate the web.
* Start Reading from Current Location: ChromeVox+R

## Jump Commands

Add the shift key to move backward through any of the following commands. “Sticky Mode” is an option, press the Search key twice quickly if desired.

* Next Button: ChromeVox+B
* Next Combo Box: ChromeVox+C
* Next Editable Text Area: ChromeVox+E
* Next Form: ChromeVox+F (Add Ctrl to open a list in the ChromeVox Panel.)
* Next Graphic: ChromeVox+G
* Next Heading: ChromeVox+H (Add Ctrl to open a list in the ChromeVox Panel.)
* Heading Levels: ChromeVox+1-6
* Next Landmark: ChromeVox+; (Add Ctrl to open a list in the ChromeVox Panel.)
* Next Link: ChromeVox+L (Add Ctrl to open a list in the ChromeVox Panel.)
* Next Table: ChromeVox+T (Add Ctrl to open a list in the ChromeVox Panel.)
* Next Visited Link: ChromeVox+V

## Websites

* Enter Ctrl+L and select a website of your choice
* [American Foundation for the Blind](https://www.afb.org/default.aspx)
* [American Printing House for the Blind](https://www.aph.org/)
* [National Federation of the Blind](https://nfb.org/)
* [American Council of the Blind](https://www.acb.org/)
* [University of Washington](https://www.washington.edu/)
* [Seattle Public Schools](https://www.seattleschools.org/)
* [InfoPlease](https://www.infoplease.com/)

## Setting Bookmarks

* Enter Ctrl+L to go to “Address and Search Bar.”
* Use ChromeVox+Right Arrow to go to “Edit Bookmark for this tab.
* Enter ChromeVox+Right Arrow again to go to “Edit Bookmark.”
* Have the student create the Bookmark folders that they need.
* The Bookmarks Bar is accessed with Alt+Shift+B.

## Excellent Accessible Web Site

[www.npr.org](http://www.npr.org/)

This site uses heading throughout and has always been very accessible.

* Enter Ctrl+T, new tab
* Enter [www.npr.org](http://www.npr.org/)
* Enter ChromeVox+. and explore the ChromeVox Panel.

### Activity 7

* Research a topic such as “Lewis and Clark” or the “Oregon Trail.” When you find out how inaccessible almost all the sites are you may start using Wikipedia more.
* Check to see if the school your student is attending has purchased access to an online encyclopedia, such as Encyclopedia Britannica Online.
* For this activity, use either Wikipedia or InfoPlease or a free encyclopedia of your choice.
* Have a Google Doc tab open while you are doing this activity. Tab back and forth between your encyclopedia article and the Google Docs file.

## Define & Explore in Google Docs

* Open a Google Doc. Place the cursor on a word that student wants to define or explore. Or keyboard in a word.
* Enter ChromeVox+M and navigate to either Define or Explore
* Define direct keystroke: Ctrl+Shift+Y
* Explore direct keystroke: Ctrl+Alt+Shift+I
* After the student has read the definition or used the Explore feature in the Sidebar, always navigate back to the “Close Dictionary” checkbox and select it. This will place the focus back in the “Document Region.”

# Gmail

## Main Points

* Keyboard shortcuts are not turned on by default in Gmail. Go to Tools, then Settings, navigate to Keyboard Shortcuts and turn them on. Save Changes at bottom of page.
* ? will open the keyboard shortcuts.
* Another way to view keyboard shortcuts is to go to Tools, and then Settings, then navigate to Keyboard shortcuts, and then select Learn More.
* Spelling checker works differently in Gmail. Use Ctrl+; to navigate forward to misspelled words, use Ctrl+’ to navigate back. Do not use ChromeVox+M, use Tab to move the focus to the suggested word. Use ChromeVox+Spacebar to select.
* Google calls Folders - Labels. Create a Label for each class the student is in, advanced students will do this independently. Go to the Advanced Search option and create a filter that will send all the teacher’s emails to the Label that was created.

## Frequently Used Keystrokes

* Compose Email: c
* Go to inbox: gi
* Go to all mail: ga
* Go to folder: gl: then keyboard the first several letters of the folder
* Go to sent messages: gt
* Move focus to search field: /
* Select messages: x
* Delete messages: #

### Activity 8

* Compose email
* Open email
* Delete email
* Move from the navigation pane to the inbox
* Attach a file and send it
* Insert a file using Google Drive and send it
* Practice creating Labels and using Labels

# Google Classroom

Google Classroom is a webpage, there are no specific keystrokes for Google Classroom, unlike Google Drive, Gmail, etc.

Students should become proficient with basic webpage navigation before using Google Classroom. The student should learn which Jump commands are most functional in specific instances in Google Classroom, in combination with the ChromeVox+Arrow Keys. The Landmarks, Headings, Links, and Buttons Jump commands should be very useful.

Teachers will be placing assignments directly in the student’s Google Calendar. The student’s calendar should always be set to Schedule View, or the student may not see these assignments.

## Structure

* Main Menu
* Current Class Name
* Stream
* Classwork
* People
* Grades
* Specific Classes

## Navigation

* ChromeVox+Arrow Keys can be used to navigate everywhere, but this will be slow.
* Use the arrow keys at the top left of the Chromebook keyboard to move back and forward a webpage.
* The shift key can always be used to move backwards through the Jump commands and in some cases this will be faster.
* ChromeVox+L: Link command, will move everywhere
* ChromeVox+H: Headings, quick way to move through all of the classes
* ChromeVox+; Landmarks
* ChromeVox+B: Will take student quickly to the “Expand About” section
* There may be some cases where the student will also want to use tab, shift/tab, and enter.

## Top and Bottom of Web Page

* ChromeVox+Ctrl+Left Arrow: Top
* ChromeVox+Ctrl+Right Arrow: Bottom

# Google Slides

Creating a Sample Presentation on Canada.

1. Open Google Drive, then enter Shift+P. This will create a blank template.
2. Google Slides teachers create can be exported as a text file.
3. You may wish to create a slide template that the student could open from Google Drive. This template could possibly have themes and transitions.
4. The title slide is the default slide when creating a new presentation.
5. Tab once to go to the first placeholder. Press enter to go from the *Object Level*to the *Edit Level***.** Enter the following information: ***Canada***
Throughout Slides presentations you will be tabbing, pressing <enter> to go the edit level, pressing escape to exit the object level after entering text, tabbing, then <enter>, then escape, etc.
6. Press Esc and tab to the second placeholder. Enter the following information:
 ***Enter Your Name***
7. Select a new slide with Control+M.
8. Press tab once to go to the first placeholder, which is the title, press <enter>. Keyboard
***Drainage***
9. Press Escape, then tab to the body of this slide and press <enter>. Enter the following:
***More than half the lakes in the world are in Canada
Canada’s longest river is the McKenzie River.
A large lake in Canada is the Great Bear Lake.***
10. Select a new slide with Control+M.
11. Tab once to go to the first placeholder, which is the title, <enter>.
***Cities***
12. Press Escape, then tab to the body, <enter>.
***The largest city in Canada is Toronto.
The second largest city in Canada is Montreal, also the second largest French speaking city.***
13. Control+M to select a new slide.
14. Press the tab key once to go to the first placeholder on the slide, which is the title. Enter:
***Hockey***
15. Press Escape and then tab to the body. Enter the following:
***There over 2,800 hockey rinks in Canada.
Ice hockey originated in Canada; the first indoor game was played in 1875.***
16. And so on…
17. Press the escape key to move back to slide thumbnails. Move to the first slide.
18. Go to View, Alt+V and select Present. Notice that only the titles are spoken, the student needs to use navigation keys to read the entire slide, or better make Braille notecards of the body of the text to use when giving the presentation.

# Google Calendar

## Keystrokes

Do not use a 3rd-party calendar app, use the Google Calendar. I prefer to bookmark Google Calendar so that I can access it easily. Students are sometime surprised that classroom teachers can set Google Classroom to place “assignment due dates” in their calendar.

[www.google.com/calendar](http://www.google.com/calendar) then bookmark it.

For a complete list of keystrokes enter ? or Ctrl+/

Enable keyboard shortcuts are turned on by default. If your keyboard shortcuts are not working they may have been turned off in settings.

* Create Event: c
* Event Details: e
* Delete Event: Backspace or Delete
* Undo: Ctrl+Z or z
* Back to calendar view: Escape
* Save Event: Ctrl+S
* Today: t
* Settings s

## Views

Views can be easily changed. The Schedule view is the most useful. In the Schedule View navigate to Main Drawer and expand it. In this view the Add Calendar keystroke is close to the list of days. Shift+=, then Shift+Tab once.

* Day View: 1 or D
* Week View: 2 or W
* Month View: 3 or M
* Custom View: 4 or X
* Schedule View: 5 or A

### Activity 9

Select dates of activities and enter them in your calendar. In some cases you may not be able to use the drop-down dialog boxes to navigate to these dates; the dates will need to be entered manually in the edit fields.

# Appendix A: Frequently Used ChromeVox Commands

This is not a complete list of ChromeVox commands; refer to the Resource page at the beginning of this manual for sources on the web that have a complete list.

## Navigation Commands

* Next or Previous Object: ChromeVox+Left or Right Arrow
* Next or Previous Line: ChromeVox+Up or Down Arrow
* Next or Previous Group: ChromeVox+Ctrl+Up or Down Arrow
* Top or Bottom of Page: ChromeVox+Ctrl+Left or Right Arrow

## Jump Commands

Use the shift key to move backwards through the commands. Turn on “sticky key mode,” press the Search key twice if desired.

* Button: ChromeVox+B
* Checkbox: ChromeVox+X
* Combo Box: ChromeVox+C
* Editable Field: ChromeVox+E
* Form Field: ChromeVox+F
* Heading: ChromeVox+H
* Next Similar Item: ChromeVox+I
* Link: ChromeVox+L
* Table: ChromeVox+T
* Visited Link: ChromeVox+V

## Activate Commands

* Click on Current Item: ChromeVox+Space
* ChromeVox Panel: ChromeVox+.
* Context Menu: ChromeVox+M
* Start Reading: ChromeVox+R

## “A” Commands

* Title of Current Page: ChromeVox+A, then W
* URL of Current Page: ChromeVox+A, then U
* Punctuation Echo: ChromeVox+A, then P
* Keyboarding Echo: ChromeVox+A, then T
* Braille Captions: ChromeVox+A, then B

## “O” Commands

* ChromeVox Options: ChromeVox+O, then O
* Keyboard Help: ChromeVox+O, then K
* ChromeVox Tutorial: ChromeVox+O, then T

# Appendix B: Frequently Used Chromebook Operating System Commands

## Chrome Interface

* Toolbar: Alt+Shift+T
* Bookmarks: Alt+Shift+B
* Launcher: Alt+Shift+L
* System Menu: Alt+Shift+S
* Notification Center: Alt+Shift+N

## Tabs

* Open a new tab: Ctrl+T
* Close tab: Ctrl+W
* Move forward through tabs: Ctrl+Tab
* Move backward through tabs: Ctrl+Shift+Tab

## Unique Chromebook Keys

The Previous Page and Next Page, left and right Arrow on the top row are very useful when moving back and forth through webpages. They are also useful when using ChromeVox, especially when used in conjunction with the Control key.

Chromebooks have a Search key where you would expect to find the Caps Lock key. The Search key is essential to ChromeVox and is called the ChromeVox key. No Caps Lock key on a Chromebook? Alt+Search is the toggle for Caps Lock.

A Windows keyboard can be plugged into a Chromebook. If this option is selected, go to Settings, Keyboard, and change the function of the Caps Lock key to Search. This is the same process used for the APH Mantis Q40 Braille display.

Matias sells keyboards designed for individuals who keyboard with one hand, the Half-Qwerty Keyboard, and a full keyboard with two embedded Half Keyboards. Their products require no drivers to install.

A large print keyboard can be connected to the Chromebook, such as keyboards made by Clevy.

# Appendix C: Frequently Used Google Drive Commands

Enter Ctrl+/ or ? for a complete list of commands while you have a Google Drive open.

## Selection Commands

Select Right Item: Right Arrow

Select Multiple Items: Use the shift key and the up or down arrow key

Clear Selections: Shift+N

## Go To Commands

Navigation Pane: gn

List View: gl

Move Up One Folder Level: gp (Or F1, left arrow, go to previous page)

## Create

Create a new document: c

Create a folder: c, then down arrow to create folder or Shift+F

When the focus in on My Drive ChromeVox will say “tree item.” Use the left and right arrow key to expand or collapse the “tree item.”

# Appendix D: Frequently Used Gmail Commands

## Frequently Used Keystrokes

* Compose Email: c
* Go to inbox: gi
* Go to Sent messages: gt
* Move focus to search field: /
* Select messages: x
* Delete messages: #
* Keyboard shortcuts in Gmail are not turned on by default. Go to Settings, Keyboard Shortcuts and turn them on.
* **?** provides a list of keyboard shortcuts
* Spelling checker works differently in Gmail. Use Ctrl+; to move forward to misspelled words, use Ctrl+’ to move backward. Do not use ChromeVox+M to move to the suggested word, use Tab. Use ChromeVox+Spacebar to select.

# Appendix E: Frequently Used Google Docs Commands

Ctrl+/ for a complete list of commands while you have Google Docs open.
Remember to turn on the Google Docs Accessibility features, Tools, then Accessibility.

## Formatting

* Heading Levels: Ctrl+Alt+1-6
* Normal Text: Ctrl+Alt+0
* Number List: Ctrl+Shift+7
* Bulleted List: Ctrl+Shift+8
* Bold: Ctrl+B
* Italic: Ctrl+I
* Underline: Ctrl+U
* Left align: Ctrl+Shift+L
* Center: Ctrl+Shift+E

## Spelling Checker

* Move to next misspelling: Ctrl+’
* Move to previous misspelling: Ctrl+;
* Context key: ChromeVox+M
* Document Check: Ctrl+Alt+X

## Suggestions & Comments

* Add a comment: Ctrl+Alt+M
* Open comments thread: Ctrl+Alt+Shift+A (Cursor does not need to be in the comment.)
* Suggestions are entered directly in the student’s Google Doc file.
* Ctrl+Alt+E, C: Works for both comments and suggestions, cursor needs to be in the comment area.
* Sometimes comments coming from numerous students in the class is very distracting, they can be turned off in Google Docs by going to Accessibility, then Settings, then Select Turn Off Collaborator Announcements.

# Appendix F: Dolphin Easy Reader

Download Dolphin Easy Reader from the Google Play Store. Android App.

## Dolphin Easy Reader Buttons

* Navigate Up
* Search
* Bookmark
* Text Settings
* Audio Settings
* More Options
* Book Field
* Progress Indicator
* Back Button, Toggle
* Slider
* Play Pause
* Navigate Previous
* Navigate Next
* Book Navigation
* Navigation Settings

## Tips

* Top of Document: ChromeVox+Ctrl+Left Arrow
* Bottom of Document: ChromeVox+Ctrl+Right Arrow
* Depending on where the focus current is, it might be more efficient to use the Bottom of Document command and then ChromeVox+Right Arrow to move to the text of
the book.

# Appendix G: Switch Access

### Chrome OS Switch Assignment

Three switches can be supported in Chrome OS switch access: Select, Next, and Previous. The switch content that is available is: none, space, enter and 1 to 5. Auto scan can be enabled.

Switch access with speech? Turn on ChromeVox, turn on Sticky Keys, and set the key content in the switch interface with three switches to left arrow, right arrow, and spacebar.

## Switch Interfaces

Bluetooth switch interfaces will work on a Chromebook. It is useful to research the key content that the switch can send before purchasing it, I would suggest purchasing a switch interface that can send as many keystroke options as possible and that has as many ports as possible. In some cases, to obtain the switch content that the student needs it will be necessary to use two switch interfaces. Generally, the more complicated a switch interface is the more keystrokes options it is capable of sending.

Some USB switch interfaces work on Chromebooks. If the switch interface does not require any drivers to be installed it will probably work. The Don Johnston Switch Interface Pro was a unit that was used frequently, but it has been discontinued. The unit that seems to have replaced it is the ATEC Computer Switch Interface: <https://www.marblesoft.online/>

When looking at any switch interface for the Chromebook it is important to know the content that the switch interface is capable of sending. In some cases, just a picture of the device will tell the user the key content it is able to send, for example the ATEC Computer Switch Interface.

Other switch interfaces to consider are the Simple Switch from Pretorian, this device can send either a spacebar and enter or a left or right click. <https://www.inclusivetlc.com/simple-switch-box>

Another switch interface to consider is the Pretorian USB Switch, this unit can support up to 3 switches and each switch can be individually configured. <https://www.inclusivetlc.com/pretorian-usb-switch>

### CVI Apps

Sensory App House: [www.sensoryapphouse.com](http://www.sensoryapphouse.com/)

Cinefx, Cinevox, Coloco, Electra, FotoFrez, Fun Painting, Imeba, Just Touch, Magma, Mandala Paint, Mica, Painting, Plazma, Speak Up, Speak Up Too, Splodge, Flames for TVOS, Lava for TVOS, Mandala for TVOS

## Apps & Websites

### HelpKidzLearn

This is a subscription service, but it always has a few free activities. The activities appear to only be accessible for low vision students. <https://www.helpkidzlearn.com/>

### SoundTouch 1 & 2

This app would work very well with a touchscreen. This Android app can be resized but does not display full screen. It does not work with ChromeVox. <https://play.google.com/store/apps/details?id=com.soundtouch2&hl=en_US>

### RadSounds

This app works very well with a touchscreen. This Android app can be resized and does display full screen. <https://play.google.com/store/apps/details?id=com.rjcooper.radsoundsce&hl=en_US>

### Railway Hero

Railway Hero: <https://pbskids.org/cyberchase/games/railway-hero>

Review of Railway Hero: <https://www.wnet.org/education/blog/railway-hero-a-new-accessible-game-from-cyberchase/>

This PBS game has an audio only mode for visually impaired users.

### Tar Heel Reader and Tar Heel Gameplay

Tar Heel Reader is a collection of free, easy to read, and accessible books.
Tar Heel Gameplay is a collection of free, easy to read, and accessible books. It can take some time researching Tar Heel Reader to locate books where the visual content of the book is not essential. <https://tarheelreader.org/>

### AAC Software

Cough Drop is an open source AAC app that runs on all devices. This app has auditory scanning and can scan by individual buttons. <https://www.mycoughdrop.com/>

## Google Forms

Google Forms can be used to create switch accessible materials.

# Appendix H: Text App & Braille Display Commands

## Text App

Use the Text app for Braille input, Google Docs does not currently provide correct Braille input. The Text app should be on your Chromebook, if you cannot find it search for the word Text in your apps or contact IT. Then pin it to the Launcher when it is open. Also use the Text app for mathematical notation, in 8 dot computer Braille code.

The Braille the student writes will be correct, but speech will only be available using the Braille review commands listed below. Use only the Word and Character navigation commands. Start by writing several characters, then enter Space + dot 3 to force the speech cursor to the Edit Field.

To copy this information into a Google Doc use Ctrl+A, then Ctrl+C, then Ctrl+V. (Space + dots 2-5, then a, Space + dots 2-5, then c, Space + dots 2-5, then v)

## Movement Commands

Top of document or webpage: Space + dots 1-2-3

Bottom of document or webpage: Space + dots 4-5-6

Next group: Space + dots 5-6

Next object: Space + dot 4 (Leaves the Edit Field)

Next word: Space + dot 5

Next character: Space + dot 6

Previous object: Space + dot 1 (Leaves the Edit Field)

Previous word: Space + dot 2

Previous character: Space + dot 3

Previous group: Space + dots 2-3

## HTML Movement Commands

Add dot 1 to any of these movement commands to move backward.

Next button: Space + dots 1-2

Next editable text area: Space + dots 1-5

Next form field: Space + dots 1-2-4

Next heading: Space + dots 1-2-5

Next link: Space + dots 4-5

Next table: Space + dots 2-3-4-5

## Mathematical Notation

Use the Text app. Mathematical notation needs to be in 8 dot computer Braille. Use space + dots 1-2-4-5 to toggle between 8 dot and 6 dot computer Braille. The only movement commands that will read mathematical notation are Space + dot 3 and Space + dot 6. Add a dot 7 for a capital letter. Numbers are Nemeth without the numeric indicator.

Plus: dots 3-4-6

Minus: dots 3-6

Multiply: dots 1-6

Divide: dots 3-4

Percent: dots 1-4-6

Left Bracket: dots 1-2-3-5-6

Right Bracket: dots 2-3-4-5-6

Decimal: dots 4-6

Less Than: dots 1-2-6

Equals: dots 1-2-3-4-5-6

Greater Than: dots 3-4-5

Left Curly Brace: dots 2-4-6

Right Curly Brace: dots 1-2-4-5-6

Upright Slash: dots 1-2-5-6

Back Slash: dots 1-2-5-6

Caret Symbol: dots 4-5

## Activate Commands

Click on current item: Space + dot 8

Delete: Space + dot 7

Toggle Speech On or Off: Space + dots 1-2-3-4-5

Activate current item: Touch any router key

Show context menu: Space + dots 1-3-4

Start/end selection: Space + dots 2-3-4

Find in page: Space + dots 3-4

Description of current position: Space + dots 1-4

Open ChromeVox Menus: Space + dots 1-4-5-6

Toggle 6 & 8 Dot Braille: Space + dots 1-2-4-5

Status Menu: Space + dots 3-6-7, then dots 2-3-4

## Keyboard Shortcuts

Ctrl: Space + dots 2-5

Alt: Space + dots 3-6

Shift: Space + dots 3-7

Ctrl + Shift: Space + dots 2-5-7

Backspace: Space + dot 7

Tab: Space + dots 3-5

Escape: Space + dots 1-3-5-6

Enter: Space + dots 4-6

# Appendix I: APH Mantis Q40 Braille Display

1. Q is for QWERTY keyboard.
2. Navigate to Terminal or press T.
3. Press a Routing Key or enter to select Terminal.
4. Navigate to USB connection and select it with a Routing Key.
5. The APH Mantis Q40 will say “Braille Display.”
6. Then use a USB A to USB C connector and plug the USB C into the Chromebook.
7. ChromeVox will start, if you have the latest Chrome OS installed and always have the latest firmware in the APH Mantis Q40.

## Chromebook Keyboard Settings

1. Go to Settings
2. Go to Device, then Keyboard
3. In Keyboard Settings change Caps Lock to Search.
4. The F1 – F10 keys are not labeled. I use a permanent marker and write above the Function Keys what the Chrome OS equivalents are. I also label the Caps Lock key as the Search key. It would be great if future versions of the APH Mantis Q40 had these keys labelled. Locator dots may also be useful on the Chromebook specific keys.

## ChromeVox Braille Settings

1. Enter Search+O, then O. Navigate to Braille
2. Select English (UEB), Grade 2
3. Braille Captions: ChromeVox+A, B

## Home Button

Pressing the Home Button will exit the Terminal mode and return the user to the Editor.

## Navigation

Use the Thumb Keys everywhere but not in a Google Doc, the thumb keys will take the student out of the document. Pressing any arrow key will place the student back in the document. Use the following navigation options instead.

1. Use the left/right arrow keys to navigate by letters.
2. Use the Ctrl+left/right arrow keys to navigate by words
3. Ctrl+Function+Left Arrow: Top of document
4. Ctrl+Function+Right Arrow: Bottom of document
5. Function Key+Arrow Keys (Selects Home, End, PageUp, PageDown)

# Appendix J: Voice Typing in a Google Doc

Go to Settings, Select Enable dictation (speak to type).

Open a Google Doc.

Navigate to Tools, Alt+t, and down arrow to Voice Typing.

Or enter Ctrl+Shift+s to start/stop Voice Typing. To stop Voice Typing say; “Stop listening.”

Always use earphones with a microphone if you are using ChromeVox with Voice Typing.

The following document from Google provides a comprehensive list of all of the Voice Typing commands: <https://support.google.com/docs/answer/4492226?hl=en>

The WSSB Tech page has this information available in Braille and print.

## Supported Punctuation

* Period
* Comma
* Exclamation Point
* Question Mark
* New line
* New paragraph

## Select Text

* Select all
* Unselect
* Select last character, select character, select next character
* Select last word, select word, select next word
* Select last line, select line, select next line

## Editing

* Cut
* Copy
* Paste
* Delete
* Delete last word

## Speak (for accessibility)

* Speak cursor location
* Speak from cursor location
* Speak selection

# Appendix K: Desmos

The Desmos calculator is available at [www.desmos.com](http://www.desmos.com)

From the top of the webpage press **tab** once to go to Math Tools, then **Enter**, then use **Tab** to navigate. The following options are available:

* Graphing Calculator
* Scientific Calculator
* Four Function Calculator
* Matrix Calculator
* Test Practice
* Geometry Tool

Press tab to go to the next link Resources. The options are

* Learn Desmos
* Accessibility
* Assessments

Under Accessibility are the following options:

* Overview
* Screen Reader Setup
* Using the Calculators
* Using Braille
* Mobile Apps
* Classroom Activities
* Keyboard Shortcuts
* Feedback

**Keyboard Shortcuts** documentation are available in Microsoft Word files, docx and Braille Ready Files, brf for the **Four-Function Calculator**, **Scientific Calculator** and **Graphing Calculator**.

The Desmos Scientific Calculator has a **Setting** Icon that looks like a wrench. Selecting this icon and turning on Projector Mode will increase the font size of the calculator. ans will place the answer in the next calculation.

Braille mode can be turned on here and Nemeth can be selected. Six key input can be selected. If you are using the APH Mantis Q40 Braille display the student can Braille with the letters fdsjkl.

Currently it is only possible to emboss graphs to the View Plus Tiger VP Max and the Enabling Technologies Romeo 60 and Juliet 120.

## Configuring ChromeVox

* Turn off Earcons if you are using the Graphing Calculator.
* Set Braille mode to 8 dot computer Braille
* Use the Forms command to navigate: ChromeVox+F, or ChromeVox+Shift+F to go backward.
* The Desmos keystrokes for Nemeth and Six-Key entry conflict with Chrome keystrokes.
* Navigate to the Setting icon and turn on Nemeth and Six Key entry.
* If the student does not know the Nemeth symbol it can be entered directly, such as sqrt for square root.

## Useful ChromeVox Braille Commands

* Enter: Space + dots 4-6
* Escape: Space + dots 1-3-5-6
* Backspace (Erase): Space + dot 7
* Navigate forward by Forms: Space + dots 1-2-4
* Navigate backward by Forms: Space + dots 1-2-4-7
* Switch between six and eight dot Braille: Space + dots 1-2-4-5

## Showing Your Equations

It is feasible to do a screenshot of six equations, however only three will display on the screen when Nemeth is on. After no more than six equations have been entered press tab three times to turn Nemeth off.

### Pasting a Screenshot into a Google Doc

* Take a screenshot with Ctrl+ (Overview Mode.)
* Open a Google Doc and paste this image.
* Alt+I for Insert, then down arrow to Image
* Right arrow to Upload from computer
* Screenshots will show under downloads

# Appendix L: Foreign Language

## Configuring

* Go to Settings
* Go to Languages and Input
* Select Add Languages
* Select the name of the language that you with to add.

## Entering Foreign Language Characters

Use Ctrl+Shift+Space to toggle between the US keyboard to the International keyboard.

When the International keyboard is selected the accented characters can be entered by using the right Alt key.

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

# Appendix M: Checklist

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

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

## Low Vision Students

Able to turn on the magnifier and large cursor: \_\_\_\_\_\_\_\_\_\_

Able to configure settings for their specific visual needs: \_\_\_\_\_\_\_\_\_\_

Able to use zoom: \_\_\_\_\_\_\_\_\_\_

Able to use the magnifier: \_\_\_\_\_\_\_\_\_\_

## ChromeVox

Able to adjust speed: \_\_\_\_\_\_\_\_\_\_

Able to adjust pitch: \_\_\_\_\_\_\_\_\_\_

Able to open/configure the ChromeVox settings: \_\_\_\_\_\_\_\_\_\_

Able to use the ChromeVox read all command: \_\_\_\_\_\_\_\_\_\_

Able to select text and then read all in Google Docs: \_\_\_\_\_\_\_\_\_\_

Able to OCR documents: \_\_\_\_\_\_\_\_\_\_

## Cursor Movement

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

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

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: \_\_\_\_\_\_\_\_\_\_

## Google Drive

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

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

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

Move to item list: \_\_\_\_\_\_\_\_\_\_

Move to navigation list: \_\_\_\_\_\_\_\_\_\_

Create a folder: \_\_\_\_\_\_\_\_\_\_

Delete a folder: \_\_\_\_\_\_\_\_\_\_

Move to a folder: \_\_\_\_\_\_\_\_\_\_

Search drive: \_\_\_\_\_\_\_\_\_\_

## Google Docs

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

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

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

Able to use the spelling checker: \_\_\_\_\_\_\_\_\_\_

Able to use heading styles and list styles: \_\_\_\_\_\_\_\_\_\_

Able to adjust line spacing: \_\_\_\_\_\_\_\_\_\_

Able to use bold, italic, and underline: \_\_\_\_\_\_\_\_\_\_

Able to collaborate: \_\_\_\_\_\_\_\_\_\_

## Internet Access

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

Able to go back one page: \_\_\_\_\_\_\_\_\_\_

Able to move forward one page: \_\_\_\_\_\_\_\_\_\_

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

Able to switch jump commands: \_\_\_\_\_\_\_\_\_\_

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

Go back one page: \_\_\_\_\_\_\_\_\_\_

Go forward one page: \_\_\_\_\_\_\_\_\_\_

Able to set bookmarks: \_\_\_\_\_\_\_\_\_\_

## Gmail

Able to compose email: \_\_\_\_\_\_\_\_\_\_

Able to go to the inbox: \_\_\_\_\_\_\_\_\_\_

Able to go to sent messages: \_\_\_\_\_\_\_\_\_\_

Able to search Gmail: \_\_\_\_\_\_\_\_\_\_

Able to attach a file and send it: \_\_\_\_\_\_\_\_\_\_

Able to insert a file using Google Drive and send it: \_\_\_\_\_\_\_\_\_\_

Able to delete messages: \_\_\_\_\_\_\_\_\_\_

## Google Slides

Demonstrate understanding of the concept of Object Level/Edit Level: \_\_\_\_\_\_\_\_\_\_

Able to open a Google Slides template: \_\_\_\_\_\_\_\_\_\_

Able to create new slides: \_\_\_\_\_\_\_\_\_\_

Able to delete slides: \_\_\_\_\_\_\_\_\_\_

Able to rearrange slides: \_\_\_\_\_\_\_\_\_\_

Able to give a Google Slides presentation: \_\_\_\_\_\_\_\_\_\_

## Google Calendar

Able to create an event: \_\_\_\_\_\_\_\_\_\_

Able to edit/view an event: \_\_\_\_\_\_\_\_\_\_

Able to adjust Google Calendar settings: \_\_\_\_\_\_\_\_\_\_

Able to change the views between day, week, month, and agenda views: \_\_\_\_\_\_\_\_\_\_

# Appendix N: Sample Writing Activities

## List Format Activity: American Revolutionary War

1. Which side had better gunpowder in the American Revolutionary War?
2. Who fought at Yorktown and is also featured in a current musical?
3. What river did Washington cross to attack the Hessians at Trenton?
4. Who is the most infamous traitor of the American Revolutionary War?

### Heading Level Activity

## Mount St. Helens

## Location

Mount St. Helens is located in Southwest Washington. On a clear day it is visible from Vancouver, WA.

## Eruption

The eruption took place on May 18, 1980. An earthquake registered at 5.1 triggered the eruption. The north face of the mountain fell away.

## Eruption Effects

1. Fifty-seven individuals were killed.
2. The volcanic cone was completely blasted away.
3. There is a crater in place of the cone now, with a small dome building.