Accessibility stories

Exercise: Actively engage with a Person with a Disability (PwD)

Having gained some understanding of disabilities and accessibility technology, it is crucial to recognize that awareness alone cannot substitute for direct engagement with individuals who have disabilities. Pay close attention as they share their needs, challenges, and insights.

Best Practices:

- Begin by asking questions that help you get to know the person. Once a rapport is established, inquire if they feel comfortable discussing their specific disability, how technology helps them, and/or simply ask for their point of view on how important building accessible experiences is.
- Avoid assuming that you fully grasp the experience of living with a disability simply because you have participated in awareness simulations. Instead, ask thoughtful questions to foster understanding, and listen actively.
- Engage with real individuals with disabilities. Seek their insights on assistive technology and resources that can help overcome barriers. Be attentive to their challenges and suggestions for solutions.

Learn more

The goal of the "Accessibility Stories" station is to emphasize the importance of direct communication with People with Disabilities (PwD). It is essential to involve PwD in every phase of projects—from definition and design to development, testing, and release—and to genuinely listen to their lived experiences while respecting their expressed needs. Awareness experiences should not replace the necessity of engaging with real individuals with disabilities. Listen attentively as PwDs articulate their needs, challenges, and ideas. Always ask questions and refrain from assuming you understand their perspective based solely on participation in awareness activities.

AI

Meet Emmet | Age 20, College student

Emmet is currently pursuing a degree in Psychology at college. He resides independently off-campus in an apartment shared with a roommate. As he is blind, Emmet is actively developing his independent living skills. He utilizes the Seeing AI application on his iPhone, which assists him with various daily tasks. This free app from Microsoft employs the device's camera to provide image descriptions for individuals with low or no vision. Emmet can use it to read his physical mail, identify canned or packaged food items by scanning product labels or barcodes, determine the color of his clothing, assess the amount of money in his wallet by reading currency, and interpret room or street signs. For those interested in experiencing the capabilities of Seeing AI or Be My Eyes, another free visual assistance tool, instructions for firsthand experience are provided below.

Exercise: App Exploration

Downloading and Installing the app on your personal phone:

1. Download Seeing AI on iOS. Visit: https://www.seeingai.com/ and select the appropriate link for your device.

2. Download Be My Eyes on Android. Visit: https://www.bemyeyes.com/mobile-app and select the appropriate link for your device.

3. Follow the standard process to authenticate, download, and install the application.

4. Open the application and begin exploring its features!

Special Notes:
While both applications offer similar functionalities, they each have unique approaches and advantages. Seeing AI is entirely AI-driven and features a menu for selecting specific functions. Users are encouraged to try the quick text feature by positioning the camera over any text, scan product barcodes, or utilize the scene feature for environmental descriptions. The person function allows users to take a selfie to have their image described and see how old the AI thinks you are.

Be My Eyes combines both AI powered and human based assistance. Users can select the Be My AI tab located at the bottom, take a picture of an object, person or scene for description, and receive feedback. A distinguishing feature of Be My Eyes is its global network of volunteers, available for assistance when AI capabilities fall short. Select the get support tab and you are provided options to call a volunteer. Users should be prepared for real-time interaction with a volunteer via an open video.

AI

Meet Kasey | Age 25, Software Engineer

Kasey is employed at a regional bank and is in the early stages of her journey into digital accessibility. She is keenly interested in digital inclusion and is committed to enhancing her knowledge on making her projects compliant with WCAG standards to ensure usability for a diverse audience. As she continues her learning process, Kasey heavily relies on Deque University for training, particularly the axe Assistant, which is powered by AI to address general accessibility and disability inclusion inquiries and assist in developing accessible solutions with the provided code samples. Additionally, she utilizes axe DevTools to conduct automated scans of her web pages to identify coding issues. After ensuring her webpage passes the automated scan, Kasey employs advanced Intelligent Guided Testing (IGT) to further evaluate her product through semi-automated manual testing practices supported by AI. Below are steps to explore these AI-based tools.

Exercise 1: axe Assistant

1. From the laptop at this table, access the Chrome browser directed to https://www.DequeUniversity.com. You should already be logged into the site; if not, please seek assistance from a volunteer.

2. In Deque University, you can browse course offerings by category and review available content. Click on the “axe Assistant” link, pose a question related to digital accessibility or disability inclusion, and experience the AI’s ability to provide tailored responses. Please leave the Deque University site open in the browser for the next participant.

Flip over for Exercise 2

AI

Exercise 2: axe DevTools Pro

1. From the laptop at this table, access the Chrome browser, open a new tab and navigate to any public website you wish to test for WCAG compliance. Once on the desired page, press Control-Shift-I to open the inspector, click on the “More” tab, and select axe DevTools. You should already be logged into an account. If prompted to log in, please ask for assistance from a volunteer. Click on the “Full Page Scan” button and wait for your report to generate.

2. In the Overview tab, you will find a list of results sorted by severity. Click on individual issues for more options and detailed information. To receive guidance on resolving specific issues, click on the “More Information” link, which will open a new browser window. Look for the heading “How to fix the problem” for additional insights.

3. To try out the next level and experience AI based self-guided manual testing, click on the “Guided Tests” tab to select one of the many IGT based tests. When you are finished please close your opened tab(s) leaving the main Deque University tab open for the next participant.

Blind and low vision

Meet Chelsea | Age 32, Intellectual property lawyer

Chelsea is an Intellectual Property Lawyer. She has been blind since she was 16. She completed her bachelor's degree in Computer Science before pursuing her law degree. Chelsea always has a computer or her mobile phone within reach. She eventually hopes to focus her practice on IP in the video game and augmented reality fields.

Exercise: Using a screen reader

Many blind and visually impaired people use screen readers to interact with websites and applications. They can pull up a list of all the headings on the page or all the links to navigate faster. Here's how you get started with your screen reader:

1. Double-click on the NVDA icon located on the desktop:
2. Double-click on the Firefox icon located on the desktop:
3. Try interacting with items on the webpage using just the keyboard.
   A list of keyboard commands is available to assist you on a separate document on this table.
4. Follow the instructions on the webpage to continue.
   Do you understand where you are on the page?
5. To prepare for the next participant, please close Firefox.
6. Turn off NVDA by pressing the Caps key + Q. NVDA will prompt you whether you would like to end the program or not. Select Yes, then Enter.

Learn more

Blindness is a spectrum. People who are blind may have no vision, but more often they do have light perception or have very poor vision acuity or significant tunnel vision.

Design Considerations for Blindness - https://dequeuniversity.com/class/fundamentals/personas/blind#considerations

Design Considerations for Low Vision - https://dequeuniversity.com/class/fundamentals/personas/low-vision#considerations

Quick Reference Guide: NVDA for Windows Keyboard Commands

Recommended browser: Firefox or Microsoft Edge

Getting Started

Browse Mode: Browse mode is used when reading documents or web pages.

Focus Mode: Focus mode is used when the user enters a form or other fields that require user input. NVDA automatically switches between Browse and Focus modes, but the user can toggle them using Insert + Space Bar.

Turn on Speech Viewer: Enabling Speech Viewer opens a window that shows everything NVDA states. This is useful for sighted users learning NVDA for testing purposes. Enable it under Tools in the NVDA menu.

To install NVDA: Go to http://www.nvaccess.org/download/ and select 'skip donation this time' to proceed with the installation.

The Basics

Task	Command
Turn NVDA on	Control + Alt + N
Turn NVDA off	Insert + Q
Stop reading	Control
Start reading continuously from this point on	Insert + Down Arrow or Numpad Plus
Read next item	Down Arrow
Read next *focusable* item (e.g. link, button)	Tab
Activate link	Enter
Activate button	Enter or Space Bar
Go to next heading	H
Go to next heading of level [1-6]	1-6
List all headings	Insert + F7
Go to next landmark/region	D
Show list of all links, headings, and landmarks	Insert + F7
Go to next table	T
Navigate table cells	Ctrl + Alt + Arrow Keys
Go to next list	L
Go to next list item	I
Go to next graphic	G
List all links	Insert + F7
Go to next link	K
Go to next *unvisited* link	U
Go to next *visited* link	V
Read entire foreground window (e.g. for dialogs)	Insert + B
Announce title of the current foreground window	Insert + T
Toggle between: radio buttons, <select> list items, tabs (ARIA widget), tree view items (ARIA widget), menu items (ARIA widget)	Arrow Keys
Go back to previous heading, landmark, table, focusable item, etc.	Shift + [H, D, T, Tab, etc.]

Reading Text

Task	Command
Say prior line	Up Arrow or Numpad 7
Say next line	Down Arrow or Numpad 9
Say current line	Insert + Up Arrow or Numpad 8
Start of line	Shift + Numpad 1
End of line	Shift + Numpad 3
Top line	Shift + Numpad 7
Bottom line	Shift + Numpad 9
Say prior character	Left Arrow or Numpad 1
Say next character	Right Arrow or Numpad 3
Say current character	Numpad 2
Say character phonetically	Numpad 5 twice quickly
Say prior word	Ctrl + Left Arrow or Numpad 4
Say next word	Ctrl + Right Arrow or Numpad 6
Say current word	Numpad 5
Say prior sentence	Alt + Up Arrow
Say next sentence	Alt + Down Arrow
Say current sentence	Alt + Numpad 5
Next paragraph	Ctrl + Up Arrow or Q
Spell word	Numpad 5 twice quickly
Spell current line	Insert + Up Arrow twice quickly

Forms

Task	Command
List all form elements	Insert + F5
Next form	F
Next focusable item	Tab
Next button	B
Select and deselect	Space Bar
Next checkbox	X
Open combo box	Alt + Down Arrow
Browse/select options	Down Arrow or First letter
Select multiple options	Shift + Down Arrow (or Up Arrow)
Next <select> combo box	C
Toggle selection	Up/Down Arrow
Next radio button	R
Toggle between focus mode and browse mode*	Insert + Space Bar

* "Focus mode" allows you to enter data into form fields. Browse mode allows you to navigate the page using standard screen reader shortcuts (e.g. to navigate headings, landmarks, links, etc.)

Tables

Task	Command
Go to next (previous) table	T (Shift + T)
Cell to right	Ctrl + Alt + Right Arrow
Cell to left	Ctrl + Alt + Left Arrow
Cell below	Ctrl + Alt + Down Arrow
Cell above	Ctrl + Alt + Up Arrow

Full list of commands: http://tinyurl.com/commands-nvda

Blind and low vision

Meet Todd | Age 37, Software developer

Todd has been progressively losing his sight after a car accident where he suffered a critical head trauma. As a Low Vision user, Todd continues to use the web every day. He relies on a magnification and screen reader software to use computers, work and navigate websites

Exercise: Low vision simulation

1. With the Eye Disease Simulator Card in hand, choose an eye disease to simulate.
2. Close one eye and hold the selected disease on the Low Vision Simulation Card up to your other eye.
3. Try to read the quotes on the 'Quote cards.'
4. Repeat with other diseases on the card or try using the goggles.

Learn more

Legally Blind — Another way to think about legally blind:

- *Acuity: Legal blindness is when your vision cannot be corrected to 20/200 or better. If either one of your eyes CAN be corrected to better than 20/200, then you are NOT legally blind.*
- *Tunnel Vision: Your field of vision is 20 degrees or less, regardless of acuity*

Low Vision in the United States for driving a car

- *Unrestricted license: 20/40 in the better eye, with or without corrective lenses.*
- *Restricted to daylight-only license: 20/50.*

Blind and low vision

“I like to make content hard to read, so no one will read it.”

—Fine Print Department

Blind and low vision

“I can read this just fine.”

—Person with 20/20 vision with bright screen and no glare.

Blind and low vision

“Good design is accessible design.”

—Dr. John Slatin

Blind and low vision

“The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect.”

—Tim Berners-Lee

W3C Director

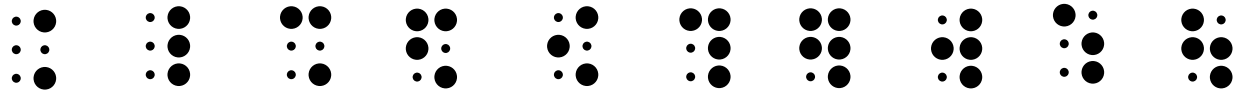
Inventor of the World Wide Web

Braille your name

Exercise: Writing braille in reverse

A person writing Braille with a slate and stylus must write from right to left and must form the Braille characters in reverse. The raised dots appear on the back side of the paper. When the paper is turned over, the dots face upward and can be felt with the fingers.

a b c d e f g h i j



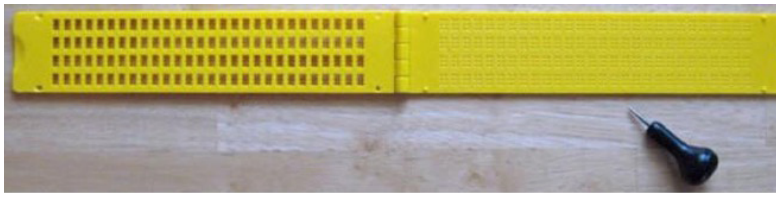
k l m n o p q r s t

u v w x y z

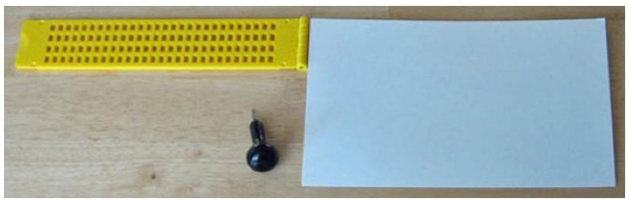
Braille your name

Exercise: Braille your name

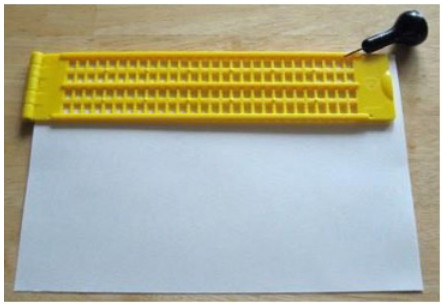
1. Place slate with window/rectangle opening part of the slate up and the hinged side on your left. Open the slate. It opens from right to left, like a book. Don't force the slate to open backwards; it could break the hinges. There is a small peg sticking up in each corner of the right-hand side of the slate and a little hole in each corner on the left side.



2. Place an index card over the right-hand part of the slate. The top of the index card should be even with the top of the slate. The left side should be next to the hinges.



3. Close the window part of the slate over the index card as if you were closing a book and push it down firmly. You will hear the four corner pegs poking through the paper into the corresponding holes to anchor the paper in place.
   The slate is now ready to use.



4. Keep in mind that you are punching through to create the letters on the backside of the paper; the user will read the punched-through side of the paper.

   a. Review the Braille Symbols on the "Writing Braille in Reverse" Guide – do NOT use the plastic Braille Guide.

   b. Write Braille in reverse order (for Joe you would punch out the J as the right-most character, then moving to the left punch the 'O,' and then further left punch the 'E' as the final character.)

   c. Write your name.

Cognitive

Meet Stevie | Age 31, UI Designer

Stevie looks at the world and sees design. She's very visually oriented in how she understands and conveys information and prefers learning by jumping into new projects. Stevie also has dyslexia and has always struggled with communicating via writing and processing written information. Nevertheless, Stevie is very skilled in translating complex concepts and user paths into intuitive, easy-to-understand layouts.

Exercise: Mirror tracing

Explore what happens when your eyes see one thing, but your brain tells you the opposite. This exercise simulates learning or relearning a motor skill.

Part 1 – On the "Tracing" Template, trace the star while looking directly at it. Starting at the top of the star, trace the entire star while being timed with the stopwatch.

Part 2 – Flip the paper over. On the "Mirror Tracing" Template, trace the star while ONLY looking in the mirror.

1. With your non-dominant hand, hold the folder or laminated colored paper provided to block your view of the star.
2. While viewing the star in the mirror, trace the entire star while being timed with the stopwatch.
   REMINDER: Only look in mirror, not at your hand, while you trace this star. No peeking!
3. Compare Your Results – both tracing accuracy and time:

- The first star shows your brain's ability to use knowledge of the world and muscle memory.
- The second star shows the challenge a person with a cognitive disability might face learning or re-learning a task.

Learn more

Skills that people use every day, like talking, typing, writing, or walking, become automatic, and rely on the brain's implicit muscle memory. This memory is largely unconscious but very important in completing everyday tasks without spending lots of effort thinking about how to interact with the world. Some cognitive disabilities that result because of changes to the brain – such as a Traumatic Brain Injury (TBI) or stroke – cause impairments to these automatic functions. Relearning these simple, implicit skills can be incredibly challenging.

Want to Know More? Recommend people check out these two amazing resources:
Making Content Usable for People with Cognitive and Learning Disabilities
Posters from the UK: Dos and don'ts on designing for accessibility

Deaf and hard of hearing

Meet Maria | Age Age 46, Senior accountant

Maria is deaf and works in the accounting department of a large engineering firm. Her team is responsible for the accounting practices of the firm with more than $50 m in revenue. Maria relies on technology to help her with communication with her hearing co-workers. While text messaging with tools like Microsoft Teams makes a big difference, sometimes the need for face-to-face interaction with co-workers is a part of life. Maria finds the Google Live Transcribe app on her Android tablet another great AI based tool to understand the spoken word in her in-office work area. It captions real time and can even allow Maria to type in responses into the tablet to aid in the conversation.

Exercise: Tablet transcribe

Speak a sentence and watch the Android tablet on the tabletop transcribe your words real-time. The app is free on the Play Store so suggest it to a friend or co-worker who could use this technology.

Learn more

- *Sign Language: remember that for some people with a hearing disability, Sign Language is their primary language.*
- *People who are deaf may be able to hear some things, but their primary means of receiving spoken communication is through visual input such as lip-reading, sign language, finger spelling, reading, or writing.*
- *People who are hard of hearing find hearing difficult, but under the right circumstances they may be able to understand spoken communication through the ear(s) alone, with or without a hearing aid.*
- *Deaf Culture: There is a difference between how people identify as 'deaf' (lowercase d) and 'Deaf' (uppercase D). Deaf with a capital D indicates a cultural identity for people with hearing loss who share a common culture and who usually have a shared sign language. People who are Deaf often take immense pride in their Deaf identity. Some do not refer to their deafness as a disability, but others do.*

Deaf and hard of hearing

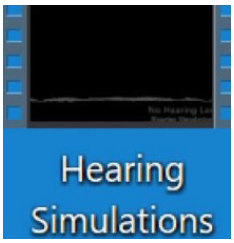
Meet Stacy | Age Age 41, Grade school teacher

Mariah is a teacher at a school for the deaf and an active member of the deaf community, leading the school's deaf choir in addition to her regular teaching duties. Mariah lost her hearing at a very young age and American Sign Language (ASL) has always been her primary language. She sometimes has a hard time following English grammar and idioms or translating all the quirks and nuance of ASL into English.

Exercise 1: Hearing loss

This exercise simulates some types of hearing loss. You will hear the same sentence four times. Keep in mind that this is a rather simplistic approach because it is "all or nothing", but it does highlight the difficulties in trying to understand speech when you have a hearing loss.

1. Double Click on the "Hearing Simulations" icon (shown below) on the Desktop.



   Listen to the below hearing simulations:

   a. No hearing loss
   b. Loss of high frequency
   c. Loss of clarity
   d. Loss of weak sounds

2. Now listen to the "Hearing Simulations" for a second time while looking at the transcript of Emily Dickinson's poem "'Hope' is the thing with feathers."

3. Close the Hearing Simulation window for the next user.

Learn more

- *Deaf Culture: There is a difference between how people identify as 'deaf' (lowercase d) and 'Deaf' (uppercase D). Deaf with a capital D indicates a cultural identity for people with hearing loss who share a common culture and who usually have a shared sign language. People who are Deaf often take great pride in their Deaf identity. Some do not refer to their deafness as a disability, but others do.*

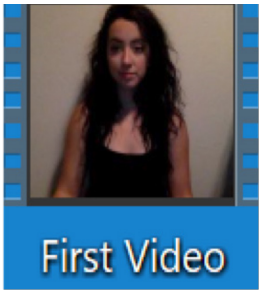
Flip over for Exercise 2

Deaf and hard of hearing

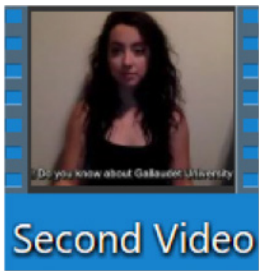
Exercise 2: Captions

On the laptop, watch a video with and without captions.
NOTE: There is no sound to these videos.

1. Double Click on the “First Video” icon (shown below) on the Desktop.
   What is the topic of this video?



2. Double Click on the “Second Video” icon (shown below) on the Desktop.
   What is the topic of this video?



3. Compare your experiences with and without captions. How important are captions to understand this video?

Learn more

People who are deaf may be able to hear some things, but their primary means of receiving spoken communication is through visual input such as lip-reading, sign language, finger spelling, reading, or writing – including captioning.

People who are hard of hearing find hearing difficult, but under the right circumstances they may be able to understand spoken communication through the ear(s) alone, with or without a hearing aid. Remember that for some people with a hearing disability, Sign Language is their primary language.

Deaf and hard of hearing

“Hope” is the thing with feathers –

That perches in the soul –

And sings the tune without the words –

And never stops – at all –

—Emily Dickinson

Innovative solutions

Meet Harold | Age 68, Realtor

Harold developed tremors in his hands a few years ago. His mother developed similar tremors around the same age. Luckily, the condition is benign, but it does complicate things like eating and drinking. Harold's tremors cause frequent spills and splashes, and enjoying a cup of coffee while remaining presentable for clients has become challenging. He is exploring assistive tools to help him perform day-to-day activities.

Exercise: The Liftware Steady Spoon

For people who have tremors, eating can be frustrating. Try comparing experiences between a regular spoon and the Liftware Steady Spoon.

Attach the spoon to the device to begin.

1. Scoop a spoonful of pebbles from the container in the regular spoon. Gently shake your hand (as if you had a tremor), while lifting the regular spoonful of pebbles.

2. Scoop a spoonful of pebbles from the container in the Liftware Steady Spoon. Holding only the base of the spoon, gently shake your hand (as if you had a tremor), while lifting the Liftware spoonful of pebbles.

3. Did you lose more pebbles using the regular spoon or the Liftware Steady Spoon?

4. Consider removing the Liftware Steady spoon attachment–if it's not going to be immediately used by the next person–to save battery power.

Learn more

Liftware Steady is a stabilizing handle with a selection of attachments that include a soup spoon, everyday spoon, and fork. It's designed to help people with mild to moderate hand tremors eat more easily. It works by sensing a person's tremor and using cancellation technology located in the handle to stabilize the utensil.

The Liftware Steady Starter Kit, used in this exercise, includes the stabilizing handle and a soup spoon attachment.

Innovative solutions

Meet Nick | Age 56, Senior Software Architect

Nick has about every ergonomic keyboard and mouse available for purchase, but when his arthritis flares up, using a mouse or typing on a keyboard is just too painful. On really bad days, Nick will use dictation software. He recently figured out that his arthritis doesn't limit his use of touch screens and is looking into his options with that kind of technology.

Exercise: Stylus comparison

1. Place 1 or 2 rubber band(s) around your fingers and thumb of your dominant hand. This will simulate arthritis and other variations of limited use of one's hands.

2. When you pick up a stylus it should look like the images shown.

3. Try picking up all the different stylus.

4. Was one stylus easier to grip than the other?

Learn more

Job Accessibility Network (JAN) has wonderful resources about accommodations by disability type. Check out JAN's Accommodation ideas for Employees with Arthritis.

https://askjan.org/disabilities/Arthritis.cfm

Innovative solutions

Meet Grace | Age 82, Retired Science Teacher

Grace's work with blind students taught her a lot about adaptability. As a senior who lives a very active and independent life, she finds innovative products that help maintain her independence – despite her now arthritic hands – of great value. Cooking, travel and gardening are some of her passions. She has found some of these products in front of you really assist her in the kitchen and the garden.

Exercise: Arthritis Products for Daily Living

Check out these innovative solutions that make using common products easier to use when your hands have limited strength or dexterity.

Fork-Spoon-Knife:
Larger handles make gripping a snap.

Easy-Hold Cup:
Two handles are better than one when it comes to balancing liquids. Try simulating taking a sip using both handles.

Key-Turner:
Providing a larger surface area to grasp when using a key to turn in a lock makes access a breeze. Try simulating turning the key in an imaginary lock.

Zipper-Assistant:
Zipping anything from a jacket to luggage is made easier when the zipper tab has a nice handle to pull. Just hook the handle to your zipper to aid in opening or closing. Give it a try!

Adaptive Gardening Tool:
Digging in the dirt is a pleasure just by changing the angle of the handle on this hand cultivator. Try simulating digging in the dirt.

Innovative solutions

Meet Joey | Age 9, 3rd grade student

Meet Joey, who embodies the spirit of a typical boy; he enjoys building with LEGO and playing with racing cars. His blindness does not hinder his enjoyment of playtime! He particularly loves toys and games designed for individuals without sight. Recently, he added the Twin Mill race car #68 to his Hot Wheels collection, which features Braille decals that make it easy for him to identify this car and others like it. When he's not pretending to be a race car driver, Joey is a passionate LEGO enthusiast.

Using his LEGO Braille bricks, Joey assists his friends and classmates in learning to read and write Braille.

He also enjoys constructing models, such as the LEGO Star Wars The Mandalorian's N-1 Starfighter Microfighter, 75363.

He accesses text-based building instructions for this set through BricksForTheBlind. By scanning a QR code, users can view the list of instructions for building the model. With these text-based instructions, Joey can build alongside his friends, who utilize LEGO pictorial diagrams to follow the same model or engage in a group building activity.

Exercise: Hot Wheels

IMPORTANT: Please keep in packaging!

Displayed are two Hot Wheels cars that demonstrate inclusion. The Hot Wheels Twin Mill racer has braille on it while the Hot Wheels Wheelie Chair shows how a brand is being inclusive with their products. More toy companies are producing toys and games that are inclusive so be on the look out for items that promote disability friendliness.

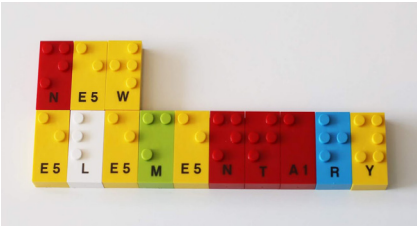
Exercise: LEGO Star Wars Kit

Review a sample of the instructions (separate card) used by blind users to build the The Mandalorian's N-1 Starfighter Microfighter. The sample card has a link to the complete set of instructions used to build the model depicted.

Learn more

LEGO offers a complete set of bricks that allow you to write in Braille.

A variety of LEGO sets with text-based instructions can be explored at: https://BricksForTheBlind.org and https://LEGOBrailleBricks.com.



Innovative solutions

Exercise: LEGO Star Wars Kit

The below is a segment of a 9-page document used by someone who is blind to build this model. The user can read the instructions on their computer using a screen reader, or have them embossed into Braille if available. Review the instructions and think about what it would be like to build a LEGO model with no pictures to look at. The build is 88 pieces, and 37 building steps.

Welcome to text- based instructions from Bricks for the Blind. Before you start building, here are some terms we'll be using: -

In Front of/ Front: towards you.

- Behind/ Back: away from you.

- Up: towards the ceiling.

- Down: towards the floor.

- Stud: the bump on a LEGO brick. Example: A 2x1 brick has two studs on it.

- Vertically: going from front to behind.

- Horizontally: going from left to right.

- Upright: pointing up towards the ceiling.

- That one/ppp: previously placed piece.

This LEGO set comes with two unlabeled bags, and an instruction booklet. Sort the pieces into groups as described below. Note that where there are multiple colors of the same brick in a step, the colors will be split across two groups to make telling the difference easier for the builder! LEGO includes a few spare parts in case you lose something. Set these into their own group away from the rest, in case you need them later.

Bag 1 (6 groups of bricks) Minifigure group 1 contains the pieces to build the Mandalorian and Grogu minifigures.

Main build: Group 1 contains the pieces for steps 1- 5. Group 2 contains the pieces for step 6.

Group 3 contains the pieces for steps 7- 12.

Building Instructions:

- Open bag 1.
- Open minifigure group.
- Assemble the Mandalorian minifigure by placing the torso on the legs, then place the jetpack down over the neck stud and place the head on top. Lastly, place the helmet on the head.
- Assemble the Grogu minifigure by placing the head onto the miniature body.

Main Build:

Open group 1.

1. Place a light gray 3x6 plate with two angled corners, vertically long with the angled side at the right, in front of you.
2. Place a dark gray 1x1 circular plate on the front stud on the leftmost column. Place another on the back stud in the same column
3. Place a light gray 2x4 plate, horizontally long and centered horizontally, on the ship so it overhangs one column to the right.
4. Keeping the angled side on the right, flip the ship over so the studs are down. Place a light gray 2x2 inverted curved slope tile, centered vertically with the cutout at the left, on the right two columns of anti- stud. " Anti- stud" is a term for the portion of a LEGO piece which accepts studs, like the bottom of a plate.

Innovative solutions

Meet Chelsea | Age 32, Intellectual Property Lawyer

Chelsea is an Intellectual Property Lawyer. She has been blind since she was 16. She completed her bachelor's degree in Computer Science before going on to pursue her law degree. Chelsea always has a computer or her mobile phone within reach. She loves to play card and board games for relaxation. She eventually hopes to focus her practice on IP in the video game and augmented reality fields.

Exercise: Playing cards and dice

Games are a great way to relax and connect with friends and family.
Most off-the-shelf games can be made accessible.

1. Pick up the Braille alphabet and number tablet.

2. Familiarize yourself with the braille symbols for…
   - Numbers 0–9 (at the bottom of the tablet)
   - Letters that represent playing card suits:
     - **S** – Spades
     - **D** – Diamonds
     - **H** – Hearts
     - **C** – Clubs

3. Use what you've just learned to read the braille on a few of the playing cards or the 20-sided dice. A playing card will have the suit letter followed by the face value of the card such as "D9" for the 9 of Diamonds.

Learn more

Accessibility in digital games is a great place to find really innovative solutions. Check out these websites for more ideas:

64oz Games: Accessible Games and Game Kits - https://64-ounce-games.myshopify.com/

Microsoft's Gaming Accessibility Fundamentals - https://learn.microsoft.com/en-us/training/paths/gaming-accessibility-fundamentals/

Game Accessibility Conference - https://www.gaconf.com/

Mobile iPhone accessibility

Exercise: iPhone accessibility

iPhone has many accessibility features including VoiceOver (a free screen reader for people who are blind or low vision).
WARNING: VoiceOver changes how you interact with your touchscreen!
Try the following activities to get a taste of how VoiceOver works.

Exercise 1: Turn VoiceOver (VO) ON and OFF

Option A: iPhone with physical home button	Option B: Use Siri
1. Triple click physical home button (to turn VO on) 2. Triple click physical home button (to turn VO off)	Say, "Hey, Siri. Turn VoiceOver ON." Say, "Hey, Siri. Turn VoiceOver OFF"

Exercise 2: Learn basic VoiceOver gestures

1. Turn VoiceOver ON (using option A or B from exercise 1)
2. Go to the home screen

- iPhone with Home Button: press home button once
- iPhone with Face ID: drag one finger up from the bottom edge of the screen until you feel a vibration or hear two rising tones, then lift your finger.

3. Read next Item = one-finger swipe right
   - Touch one finger to your iPhone screen and swipe right
   - VoiceOver will announce the name of the app in focus
   - Use one-finger swipe right a few more times to hear the next few apps

4. Activate link or button in focus = one-finger double tap
   - Open the App currently in focus with one-finger double tap anywhere on iPhone screen
   - Turn VoiceOver OFF (using options A or B from exercise 1)

Flip over for Exercise 3

Mobile iPhone accessibility continued

Exercise: iPhone accessibility (continued)

Exercise 3: Learn basic VoiceOver gestures

1. Start from the Home Screen
2. Turn VoiceOver on (using Option A or B from exercise 1)
3. One-finger swipe right (or Left) to the Camera App
4. One-finger double tap to open Camera App
5. Use one finger to swipe right through each of the camera controls. Listen to VoiceOver tell you which control is in focus.
6. Point camera lens so there is at least one face in viewfinder. Listen to VoiceOver tell you if faces are in viewfinder.
7. Use one finger swipe right (or left) to “Take Picture Button”
8. One-finger double tap “Take Picture Button”

Learn more

We recommend checking out these wonderful resources:

iPhone - Getting Started with Accessibility Features - https://support.apple.com/guide/iphone/get-started-with-accessibility-features-iph3e2e4367/ios

Mobile Android accessibility

Exercise: Android accessibility

Android devices include a screen reader built by Google called TalkBack. You should be able to find TalkBack in your phone's settings menu under Accessibility.
WARNING: TalkBack changes how you interact with your touchscreen!

***Note**: There is some variation in how you navigate to accessibility features on Android phones. If you don't see Accessibility in the top level of your settings navigation, you may need to go Settings > General > Accessibility.*

Exercise 1: Turn TalkBack ON

1. To turn on TalkBack go to ***Settings > Accessibility > TalkBack.***
2. ***Single tap*** the TalkBack "Off" switch to toggle it ***"On"***
3. ***Single tap*** the ***"Allow"*** button on the confirmation screen.

Exercise 2: Turn TalkBack OFF

1. To turn off TalkBack go to ***Settings > Accessibility > TalkBack.***
2. ***Single tap*** the TalkBack "On" switch to select it.
3. ***Double tap*** the TalkBack "On" switch to toggle it ***"Off"***.
4. ***Single tap*** the "Turn off" button to select it.
5. ***Double tap*** the ***"Turn off"*** button.

Flip over for Exercise 3

Mobile Android accessibility continued

Exercise 3: Learn 2 Basic TalkBack Gestures

1.Turn TalkBack on: **Settings > Accessibility > TalkBack.**

- ***Single tap*** the TalkBack "Off" switch to toggle it **"On"**
- ***Single tap*** the **"Allow"** button on the confirmation screen

2. **Go to the Home Screen**
   - **If the device has a physical home button**: Press **Home** or
   - **On most devices:** In one motion, swipe up then left.

3. **Read Next Item = One Finger Swipe Right**
   - Touch one finger to your Android screen and swipe right
   - TalkBack will announce the name of the app in focus
   - Use "One Finger Swipe Right" until you are on the Clock app

4. **Activate** Link or Button in Focus = One Finger Double Tap
   - Open the App that currently has focus with a one-finger Double Tap anywhere on your Android screen
   - Try opening the Clock app

5. Scroll a Page or Menu = **Two Finger Swipe Up,** Down, Left or Right
   - Touch two fingers to your Android screen and swipe up

Learn more

We recommend checking out these wonderful resources:

Android Accessibility Overview - https://support.google.com/accessibility/android/answer/6006564?hl=en

Motor

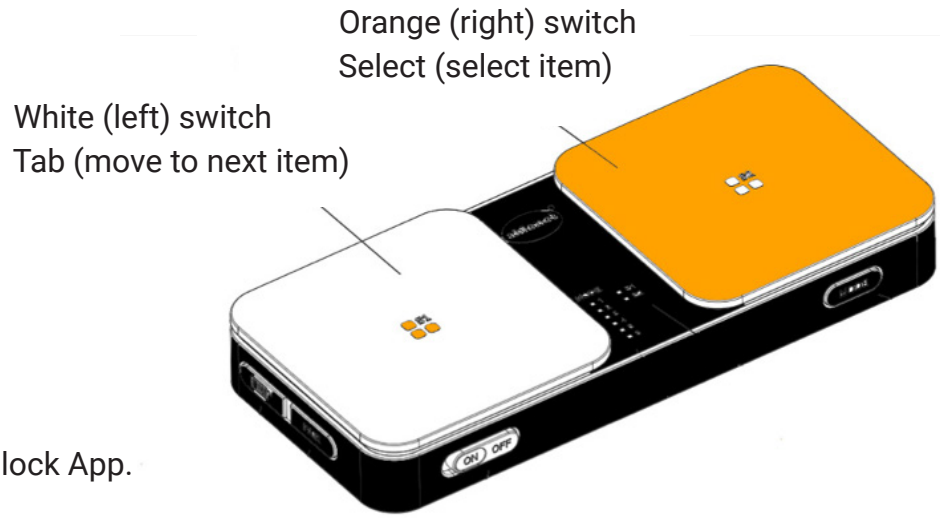
Meet Donna | Age 22, College student

Donna is about to graduate with a bachelor's degree in Radio, TV and Film. She has cerebral palsy but never considers her disability a barrier. Her limited motor control makes using a standard keyboard, touchscreen or mouse ineffective. However, she is very adept using a switch control with her laptop, tablet and mobile phone.

Exercise: Switch control with iOS

Switch controls allow people with limited motor control to use technology by activating a switch or button. The AbleNet Blue2 Switch used in this exercise has two switches.

- Switch 1 – The white (left) switch tabs through items.
- Switch 2 – The orange (right) switch selects items.



Ready to try?

1. Open the Clock App on the iPad.
2. Open the Stopwatch within the Clock App.
3. Start and stop the Stopwatch.
4. Reset for the Next Person by closing the Clock App.

Lost? *You can cheat and use your finger to touch the iPad. (We won't tell!)*

Extra Credit: Try doing this task with your non-dominant hand!