



# Switch It Up: From Adapted Toys to Therapeutic Gaming

Mia Hoffman & Seong-Hee Westlake



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## Disclosure – Mia Hoffman & Seong-Hee Westlake

- Relevant Financial Relationships
  - Little Lake Tech provided demo switches
- Relevant Nonfinancial Relationships
  - Mia is a PhD Candidate at University of Washington
  - Seong-Hee is a rehabilitation engineer at University of Michigan

Please do not take photos or videos of children's likeness.



# Outcomes

- Identify different types of switches and other controls
- Understand how to modify and position gaming controls for pediatric clients
- Select games that match a child's interests, cognition, and abilities.
- Learn how to use free tools currently on the market to create simple custom games that meets specific therapeutic goals

# Play is essential....

Self-regulation

Cognitive development

Language development

Exploration

Emotional well-being

Social development



## It's a human right!



[1] Fiss et al. *Behav Sci* 2023 [2] Lifter et al. *Infants & Young Child*. 2011

**What switch-adapted  
technology can you think of?**

# Switch-adapted toys provide opportunity

- Increases access to independent play<sup>1,2,3</sup>
- Increases access to cognitively-appropriate toys<sup>1,3</sup>
- Support cause-and-effect learning<sup>3</sup>
- Foster social interaction<sup>3</sup>
- Practice self-initiated movements<sup>3</sup>



# Ongoing challenges with switch adapted toys



*Image from UW HuskyADAPT*

- Cost 3-5x more than off-the-shelf toys
- Not easily found in all geographic areas
- Adapting yourself... technical skills required
- Families and clinicians may need support to use regularly

# Developmentally Inspired Pediatric AT



**Adaptive** over time to limit need for multiple devices



**Flexible** for both needs of child and their therapy goals



**Durable** to kid wear and tear and multiple environments



**Low-Cost** to improve technology access for families



Socially welcoming **Aesthetic** to enhance peer interaction



**Accessible** to as many children as possible

# Commerical switches - Buttons

Orby™ Switch

Button-style Adaptive Switch



Orby Button Switch  
*Origin Instruments*  
**\$49.95**



Big Mack Switch  
*AbleNet*  
**\$155.00**



Blue2 FT  
*AbleNet*  
**\$260.00**

# Sip & Puff Switch



Sip and Puff Switch  
*Origin Instruments*  
**\$324.50**

Sip/Puff Switch with Headset



Sip/Puff Switch with Gooseneck



# A plethora of commercial switches



Adaptive Gaming Kit  
Logitech  
\$99.99

 <p><b>4 LIGHT TOUCH BUTTONS</b></p> <p>Sensitive, light-pressure buttons with a 12 mm height can activate with low force.</p>	 <p><b>2 VARIABLE TRIGGERS</b></p> <p>Pressure-sensitive triggers can function like gas pedals, ideal for racing games or other applications. Force tune them for optimum control and comfort.</p>
 <p><b>3 SMALL BUTTONS</b></p> <p>Approximately 1.4" buttons, built with mechanical switches, offer durable and consistent actuation. Low height allows for easy and quick presses.</p>	 <p><b>3 LARGE BUTTONS</b></p> <p>Approximately 2.5" buttons built with mechanical switches are reinforced with stabilizer bars for consistent actuation across the full surface.</p>

12 Switches

# Proximity switches

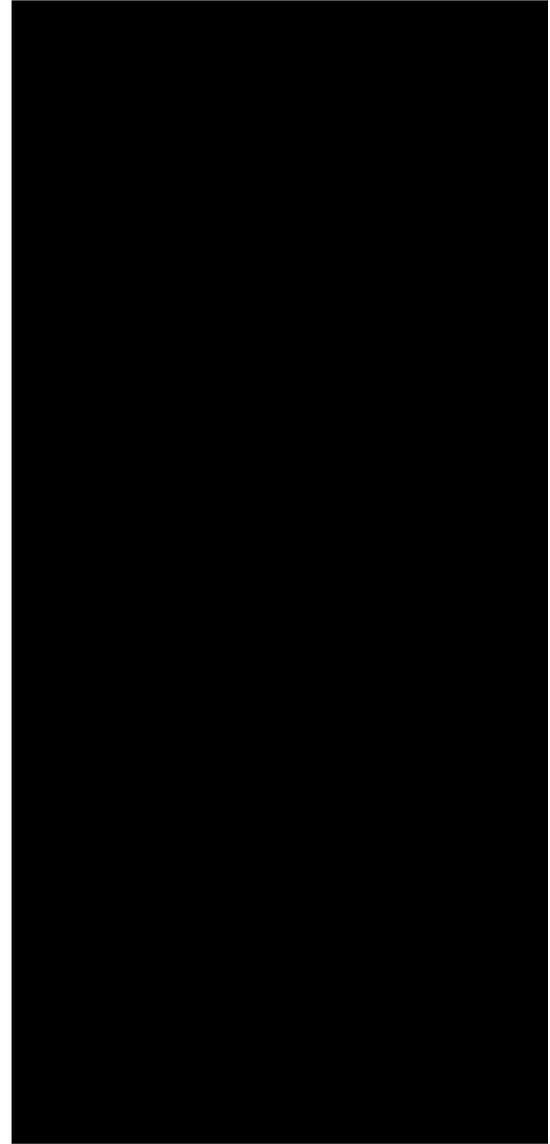
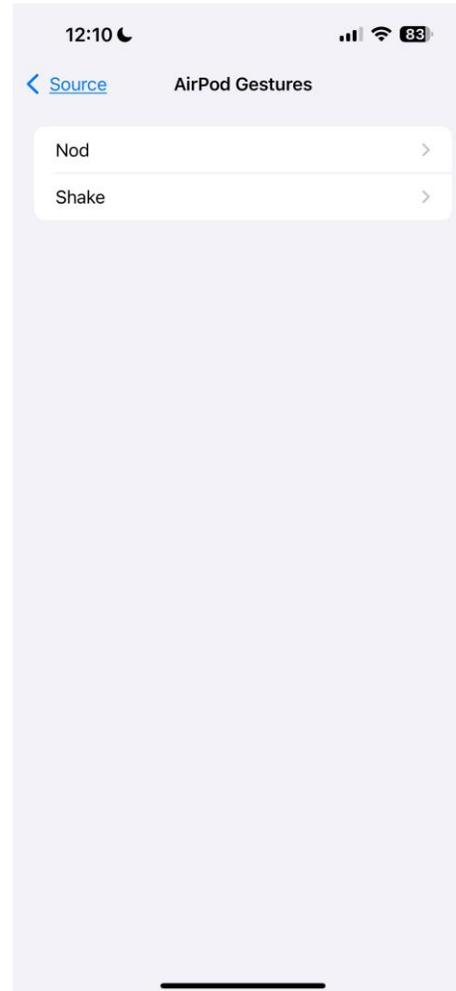
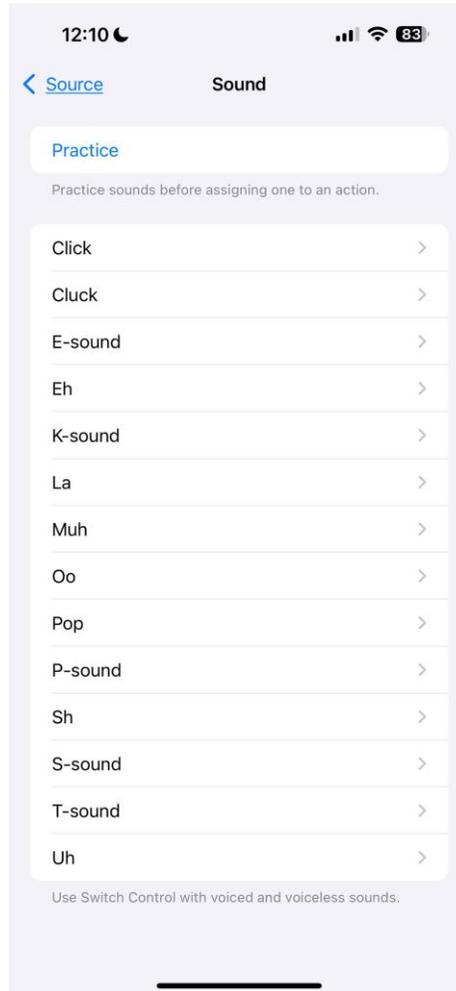
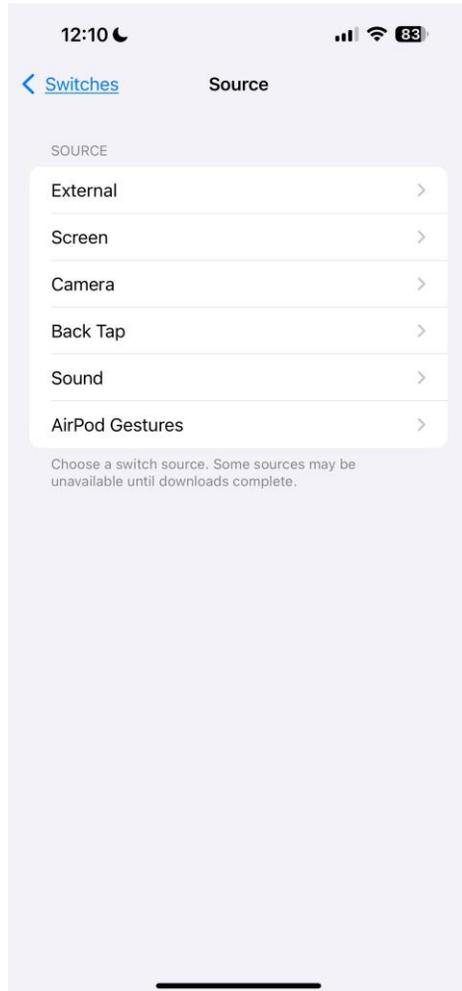


Hover Switch  
*Little Lake Tech*  
**\$49.95**



Candy Corn Switch  
*Ablenet*  
**\$255.00**

# Native Switch Options: iOS



# Low-cost switches



3D printed switches

[switchedtoys.org](http://switchedtoys.org)



Conductive tape switches

[miahoffmann.d.github.io/switchkit](http://miahoffmann.d.github.io/switchkit)



Adapted buzzers

Etsy shops

# Other ways to access switches?

	Big Candy Corn Switch	Environmental Adaptations
	Big Key Keyboard (Black Key/White Print)	Computers and Related
	Big Red Switch	Environmental Adaptations
	Big Step by Step Communicator	Speech Communication
	BIGmack Communicator	Speech Communication

Your State's Assistive Technology Act Program



Makers Making Change



[About Us](#) [Toy Adaptation](#) [Design](#)

## HuskyADAPT is designing a more accessible future.

At HuskyADAPT, we foster an inclusive, sustainable, and multidisciplinary community at the University of Washington to support the development of accessible design and play technology.

[Get Involved](#)

[Donate to HuskyADAPT](#)

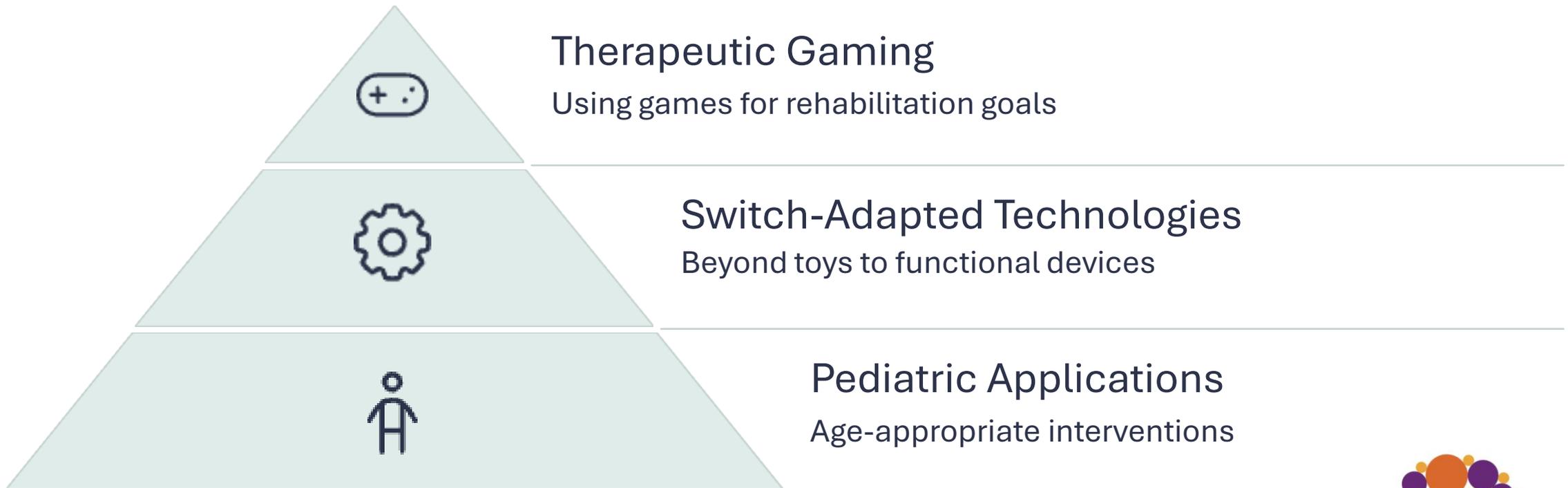
Local university



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# Moving beyond switch-adapted toys, other switch-adapted technologies + what therapeutic gaming is in pediatrics



# Consoles & Controllers



Hori Flex Controller  
*Nintendo Switch*  
**\$249.99**



Xbox Adaptive Controller  
*Xbox*  
**\$99.99**



Sony Access Controller  
*Playstation*  
**\$89.99**

# Connecting to Computers



Microsoft Adaptive Hub  
*Microsoft*  
**Bluetooth**



Tapio  
*Origin Instruments*  
**Wired Connection**



Blue2 Switch  
*AbleNet*  
**Bluetooth**

# Simple positioning ideas



Jaws Flex Clamp  
Smartphone  
Mount



**ModularHose**™

## Gooseneck Mounts



## Pegboard + Zipties



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# Matching games for pediatric clients



## Identify Available Games

What games are out there?

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## Assess Accessibility

Evaluate control options

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## Match to Client

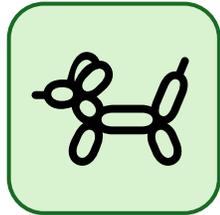
Consider abilities and interests

# Guidelines for identifying games



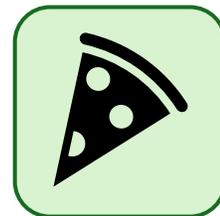
## Little ones (0-4 yrs)

Simple cause and effect games with bright visuals



## Elementary school aged

Games with clear goals and moderate complexity



## Middle school aged + pre-teen

Age-appropriate content matching interests

# Children Adaptive Video Games

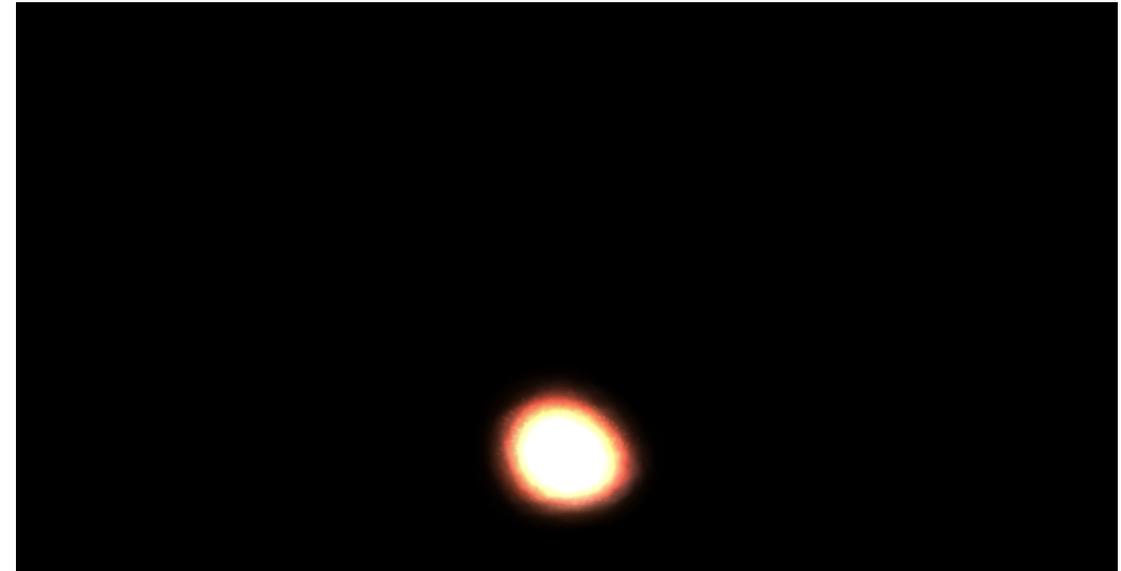


# Age-appropriate vs cognitively appropriate

Which would you select for a 13-year-old boy?

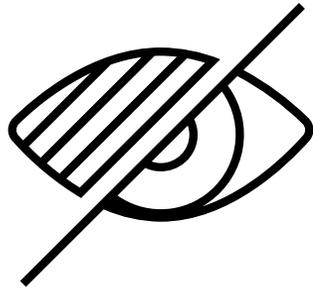


*Bluey Dancing*



*Explosions*

# Sensory Modalities



## Vision challenges

Multimodal feedback

- visual and audio
- visual and haptic



## Timing

Reaction time of child



## Stimulation

- Overstimulation
- Sound sensitivities
- Light sensitivities

# Game example: Plants vs. Zombies

- Moderate timing
- Visual scanning
- Executive function



# Game example: Minecraft Dungeons

- Short mission-based games
- Joystick + 1 button minimum
- Co-pilot play option
- Great options for preteen to teenager



# Game example: Mario Kart

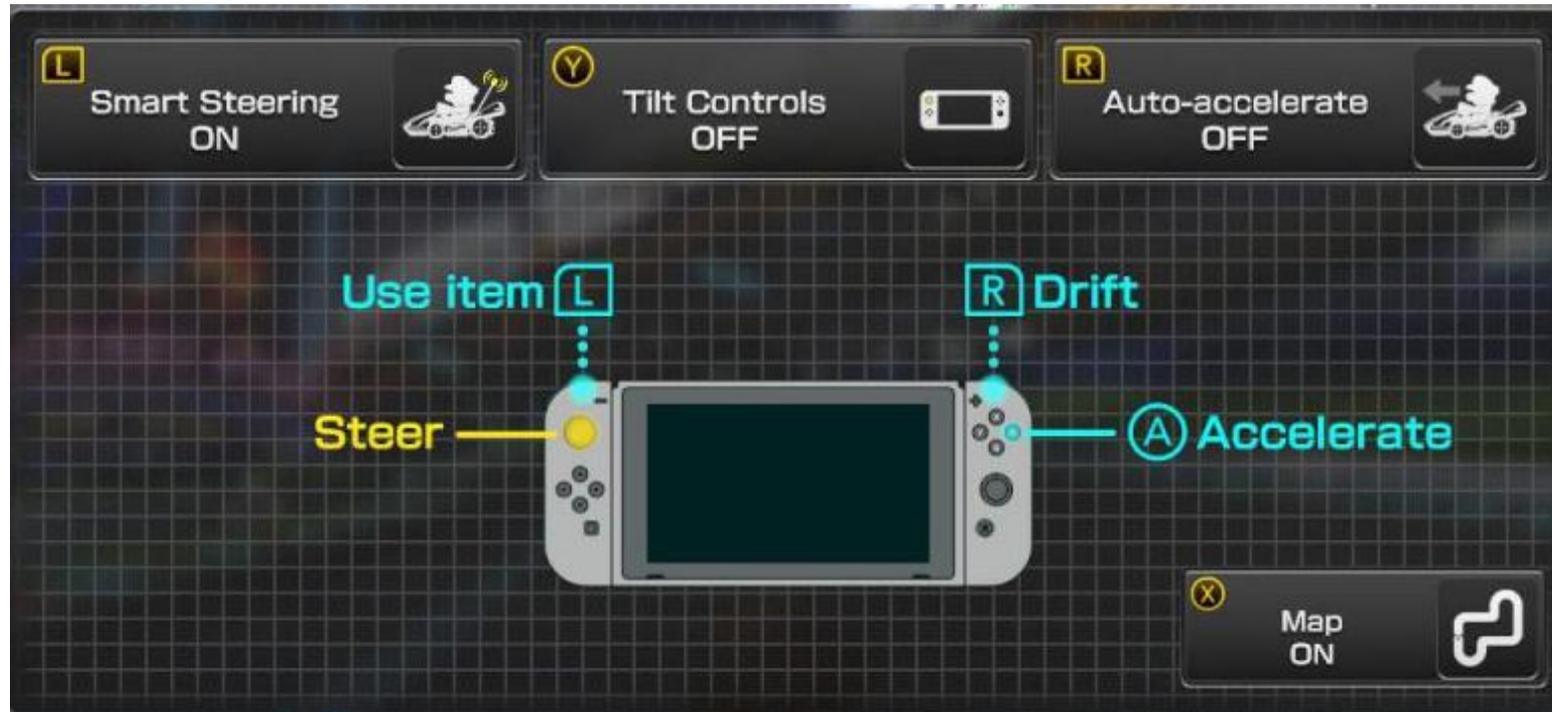
- Wide age range (fun for kids and adults)
- Up to 4 players co-play
- Joystick only minimum
- Joystick + 1 button option



# Mario Kart: Practice directional steering

**On:** Game corrects steering

**On:** Kart moves forward without needing to press button



# Mario Kart: Practice sustained switch press

**On:** Game corrects steering

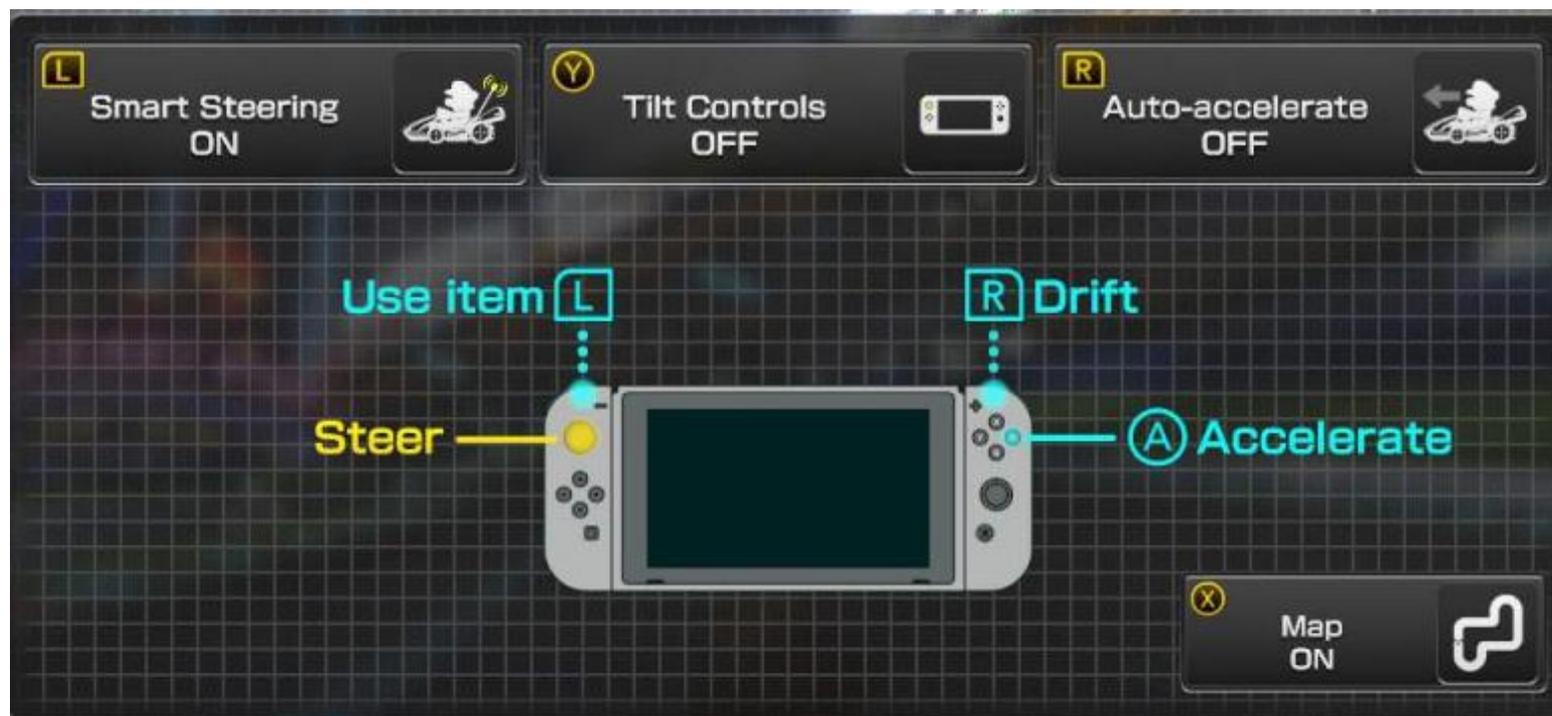
**Off:** Child needs to press button to move



# Mario Kart: Just have fun

**On:** Game corrects steering

**On:** Kart moves forward without needing to press button



# Switch-accessible reading



## LOS TRES CERDITOS



Fairy and Folk Tales

Fiction

Author: TarHeel (adawilda24)

Rated E/Everybody

Language: Spanish

Pages: 14

Back

Read



Monarch Reader™  
by Building Wings

Monarch Reader™  
by Building Wings



## LOS TRES CERDITOS

Page 1



# Switch-accessible videos

Tar Heel Gameplay

Enter text to search  All Topics  Any rating

Cause/effect  English

<b>choo choo vc</b> shouse333  3	<b>Core Word: Open Love is an Open Door</b> psuwanski  2	<b>(What) Makes You Beautiful</b> lindsay584  3	<b>Donald Where's Your Troosers?</b> charrison  3
<b>A Farmer's Life for Me</b> charrison  3	<b>Polar Bears Amazing Animals Series</b> Lizcastagnera  2	<b>Anzac Day</b> Cathy McLeod  4	<b>Sings Best Songs (video) 15:43</b> michellesciberras  16



Tar Hel Gameplay

# Other online switch-accessible resources

Name	Description
<a href="#">Simplebites</a>	Cause-and-effect games designed for switch access
<a href="#">Owlie Boo</a>	Cause-and-effect animal animations that respond to one button
<a href="#">Shiny Learning</a>	Switch-accessible games, mostly behind a paywall
<a href="#">Papunet</a>	Switch-accessible games
<a href="#">Help Kidz Learn</a>	Subscription-based switch-accessible activities and games
<a href="#">Coolmath Games</a>	A collection of one-button games for kids, not explicitly switch-accessible and many require precise timing

# How to identify games?

The screenshot shows the homepage of 'CAN I PLAY THAT? AN ABILITYPOINTS INITIATIVE'. The navigation bar includes 'CIPT', 'News', 'Reviews', 'Codex', 'Lexicon', 'Features', 'Resources', and 'About', along with 'Search' and 'Preferences' buttons. The main content is divided into two sections: 'Accessibility Reviews' and 'Latest from CIPT'. Under 'Accessibility Reviews', there are two featured articles: 'Split Fiction accessibility review' (dated April 18, 2025, by Mike Matlock, 8 minute read) and 'Atomfall accessibility review' (dated March 26, 2025, by Marijn / ActiveBT, 12 minute read). The 'Latest from CIPT' section features a news item: 'Valve announces accessibility tags for Steam' (dated April 23, 2025, by Marijn / ActiveBT, 3 minute read).

Can I Play That?

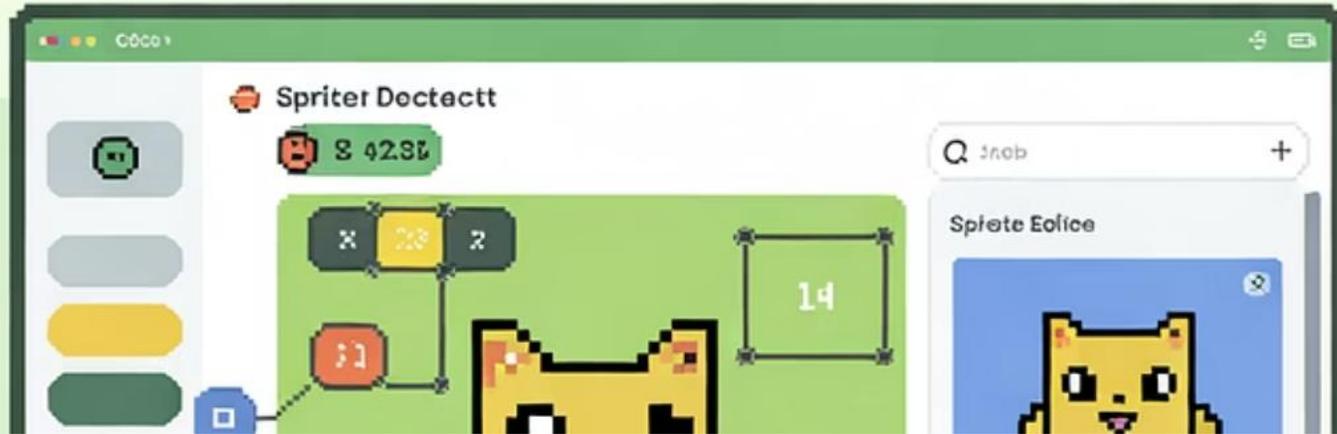
The screenshot shows the 'Accessible Games Database' website. The header is red with the site name and a sub-header 'a DAGERSystem service powered by Apex Access'. Navigation links include 'Games', 'Contact', 'Report an Error', 'Donate', and a search icon. The main content area has a 'Filters:' section with dropdown menus for 'Publishers', 'Genres', 'Platforms', and 'ESRB Ratings'. The 'ESRB Ratings' menu is expanded, showing options for E, E 10+, T, and M. Below the filters, it says 'Showing 1-12 of 158 results'. There are three game covers displayed: 'Alien Isolation', 'Anthem', and 'ARK: Survival Evolved'. A 'Default sorting' dropdown is visible in the top right.

Accessible Games Database



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# Build your own games

## Learn Scratch Basics

Understand block-based programming fundamentals

## Design Therapeutic Game

Create games targeting specific therapy goal and interest

## Implement Accessibility

Add high contrast features and simple controls

## Test with Clients

Refine based on therapeutic outcomes

# Creating CVI friendly games

My child has CVI. How can we create a game for her that can work on AAC skill development?

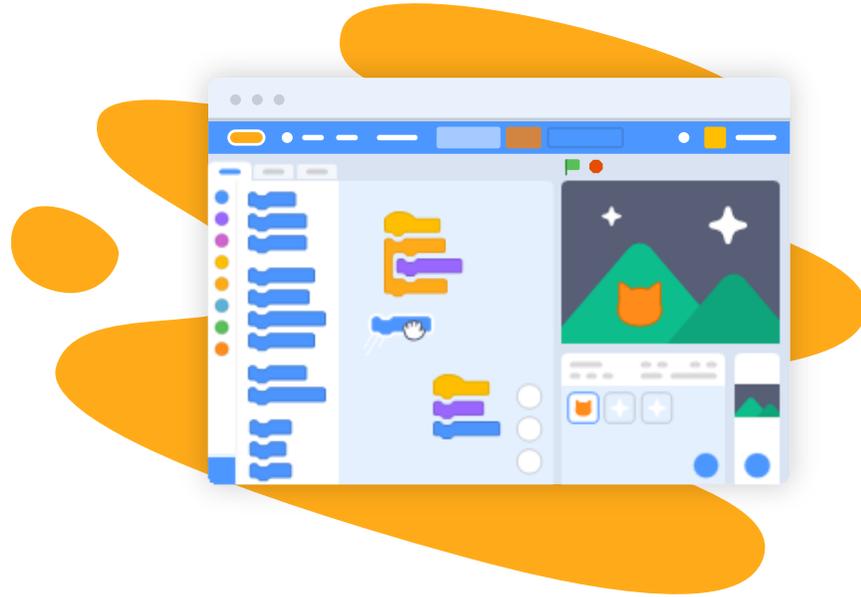


**Left arrow:** Rainbow plays chime sound

**Right arrow:** Heart plays classical piano



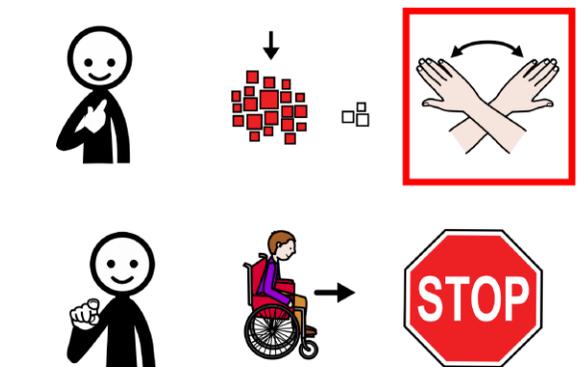
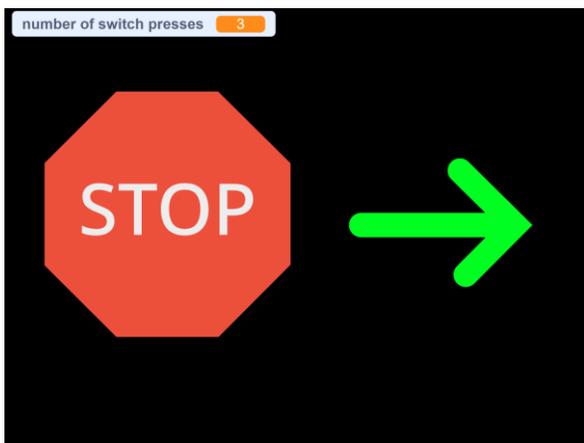
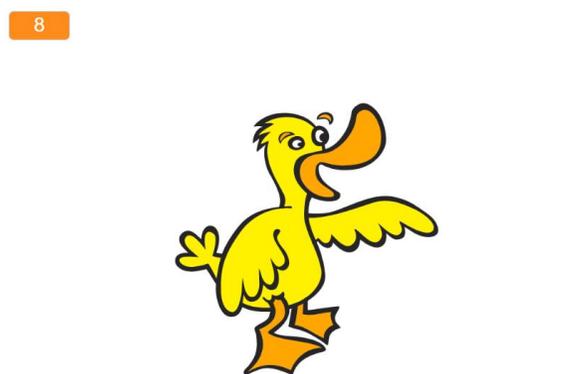
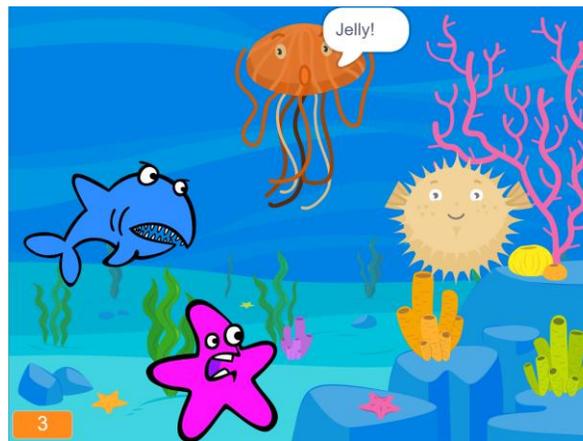
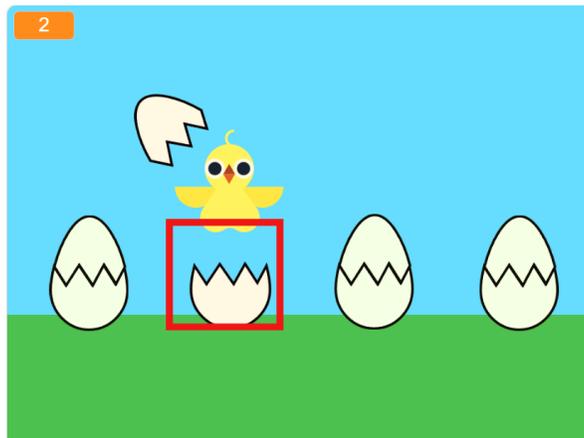
# Using Scratch to create custom games



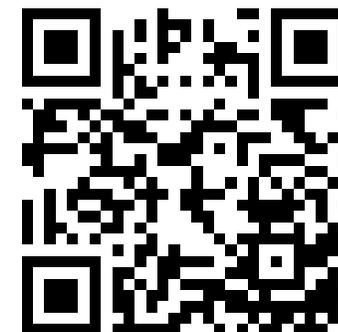
Block-based coding language  
to create interactive games  
and animations



# Scratch game library



Scan here to access



[left] Duck grows

[right] Duck reset

# Working on cause-and-effect

Scan here  
to access  
library



Evie likes dinosaurs.

```
when clicked
switch costume to dinosaur4-a
```

When game starts, set initial costume.

```
when space key pressed
switch costume to dinosaur4-d
start sound Squeaky Toy
wait 2 seconds
switch costume to dinosaur4-a
```

When spacebar pressed, switch costumes and make a squeaky toy sound.



Scan here  
to access  
library



# Working on two choices



Alfonso likes music.

```
when left arrow key pressed
  switch costume to Drums Conga-b
  stop all sounds
  play sound Drum until done
  switch costume to Drums Conga-a
```

When left arrow key pressed, play Drum sound.

```
when right arrow key pressed
  stop all sounds
  switch costume to keyboard-b
  play sound Classical Piano until done
  switch costume to keyboard-a
```

When right arrow key pressed, play piano sound.



Scan here  
to access  
library



# Learning to use a joystick

Goal: Learning to use a joystick



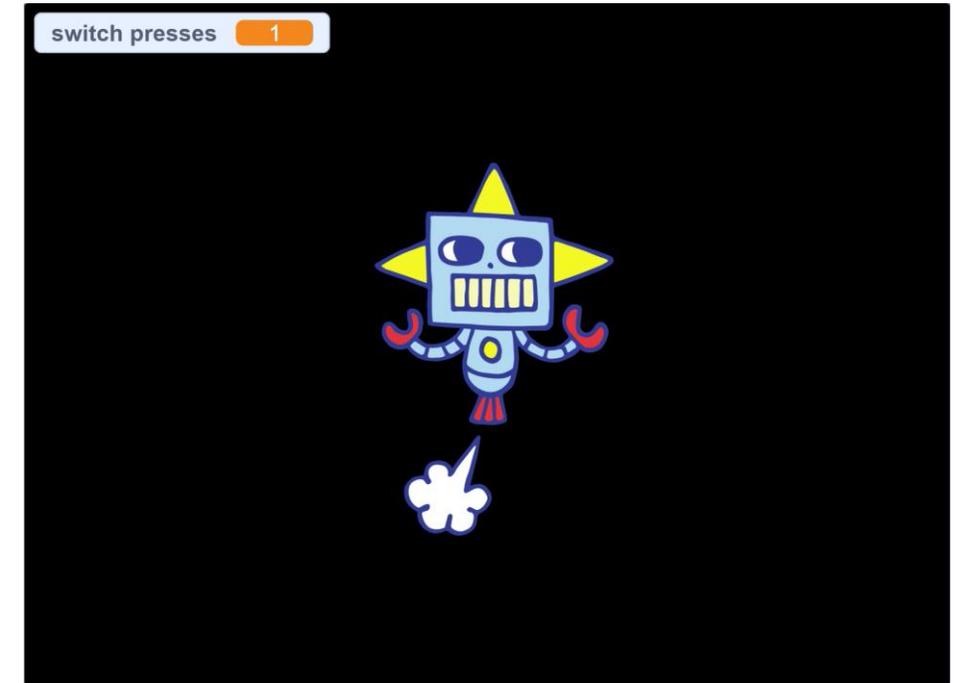
Julio loves  
fantasy.

```
when down arrow key pressed
if controls = arrow keys then
  change y by -10
```

When down arrow  
pressed, robots  
moves down.

```
if touching edge ? then
  hide
  start sound Squish Pop
  broadcast confetti
  wait 2 seconds
  go to x: 0 y: 0
  point in direction 90
  show
```

When robot is  
touching edge of  
screen, confetti  
appears.





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# Building your own toolkit: plug and play



USB-C or Lightning  
Adapter  
*Amazon*  
**\$5-10**



Tapio  
*Orion*  
**\$119.95**



Scallop Switch  
*American Printing House*  
**\$35**

**Total Cost: \$165**

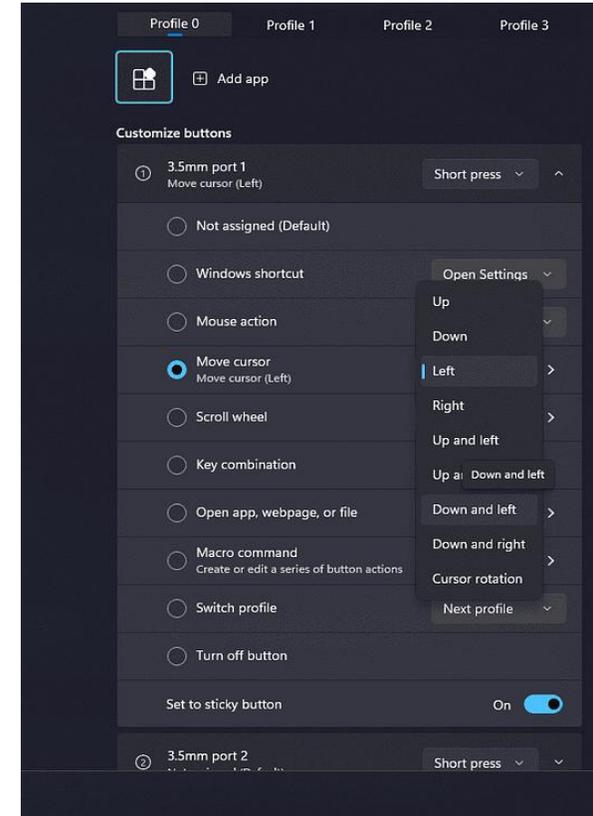
# Building your own toolkit: more options



Microsoft Adaptive Hub  
*Microsoft*  
**\$99.99**



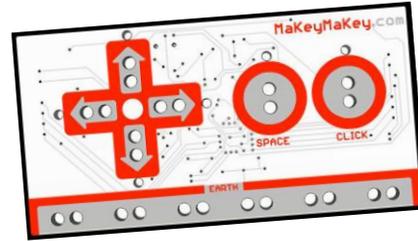
Microsoft Adaptive Joystick  
Button  
*Microsoft*  
**\$59.99**



*Set up required using Microsoft  
Accessory Center*

**Total Cost: \$160**

# Building your own toolkit: from scratch



MakeyMakey

**\$49.99**

switch-accessible  
MakeyMakey input  
device

Other components for  
input device

**\$15**



do-it-yourself  
switches



Aluminum foil tape

**\$6-8**

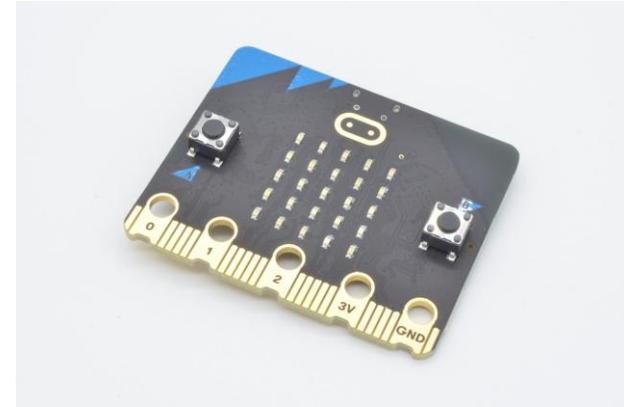
*Learn more at  
Switch Kit  
website*



# Building your own toolkit: 3D printing



**Microbit Tap**



**Micro:bit Bluetooth v2**  
**\$20.00**



*Learn how to  
3D print this  
here*



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- ✓ Build your own toolkit

# Looking towards the future



**Mobility**



**Independence at Home**



**Community Participation**

# Questions?



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