Session Code: ATPAP-49

ATiA 2020

Two-Switch Step Scanning & CVI:
Reduced Visual-Complexity and Auditory Supports

Linda Burkhart
Independent Consultant
linda@Lburkhart.com

Fio Quinn
Independent Consultant/Content Developer
mfquinn@srt.com

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Speaker Disclosures

Linda Burkhart is a private consultant and presents trainings around the world. In addition, she has a small home business for several books and software titles she has authored.

She is the author of Mind Express Activities: Steps Before Step Scanning and Switch Accessible Literacy Smorgasbord (in process)

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Speaker Disclosures

Fio Quinn is a private consultant, trainer, and developer of educational resources. She presents trainings in the U.S., Europe, and other parts of the world.

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Learning Objectives

Describe 2 reasons why two-switch step scanning may work better for children who have severe physical challenges and CVI

List 3 features of commercially available step scanning tools (software, apps and/or websites) that may support the needs of individuals who have CVI

Explain 3 ways to modify, adapt or design the visual and auditory presentation of two-switch step scanning activities to more effectively meet the unique needs of individuals with CVI

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Which Kids?

- Cortical / Cerebral Visual Impairment (CVI)
- Physical Challenges that limit direct select access to a computer display

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This presentation will assume basic knowledge of CVI

★ Vision impairment <u>caused by brain damage</u> or difference - not problems at the eye (however the child may have both)

★ Children's vision may <u>improve with appropriate intervention</u> in terms of materials used, how they are presented and environmental conditions

★ <u>Individual Assessment is critical</u>, because characteristics vary for each child and change over time resulting in different intervention needs

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Resources:

1. Dr. Christine Roman- Lantzy's CVI Range: Roman- Lantzy, C. A. (2007, 2018). Cortical Visual Impairment: An Approach to Assessment and Intervention. New York: AFB Press) www.afb.org/store

2. Numerous online webinars and videos by Dr. Christine Roman-:Lantzy related to the CVI Range (both free and paid)

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More Resources:

1. Gordon Dutton: CVI Scotland https:// cviscotland.org - extensive website explaining CVI and appropriate strategies.

2. Amanda Hall Lueck and Gordon Dutton, Vision and the brain: understanding cerebral visual impairment in children, New York, NY : AFB Press, American Foundation for the Blind, 2015)

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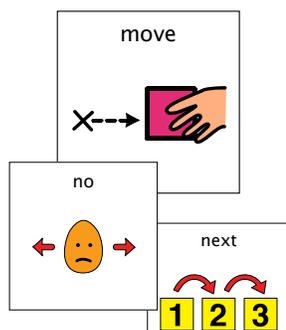## Why Two Switch Step Scanning? vs. Automatic/Timed Scanning?

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Types of Scanning

- Automatic Scanning
- Inverse Scanning
- Step Scanning with a Delay
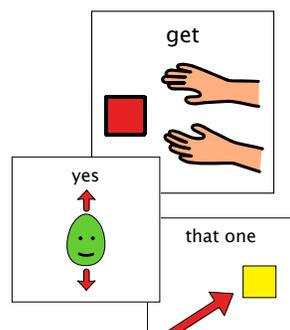- 2 Switch Step Scanning

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Two Switches

Mover Switch

move

X - - >

no

next

1 2 3

Get it! Switch

get

yes

that one

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Eliminate Timing (Timing requires automaticity)

You need to slow down to learn the graded movement

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When you do something fast, you can only use motor skills that you have already developed to automaticity….

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When you do something fast, you can only use motor skills that you have already developed to automaticity….

You can not improve or refine your motor patterns without slowing down and attending to what you are doing

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Active vs. Passive

at child's

attention

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Using two switches <u>without timing</u> is frequently easier and leads to development of more controlled refined movements than using one switch <u>with timing</u> demands

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Fatigue

- No timing (2 switches): more activations, potentially more physical fatigue but also potential for building endurance over time, (However, caution for those with degenerative diseases)

- Timing (1 or 2 switches): Less activations but potentially more cognitively fatiguing from needing to focus attention to accurately move at the right time

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Concentration, Distraction and Social Pragmatics

- When child is distracted or engaged with others in a social connection, the scan waits at the same place for them to resume what they were scanning.

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Two Switch Step Scanning: Allows <u>Child to Pace his Own Processing Time</u>

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This presentation also assumes a basic knowledge of <u>Stepping Stones to Switch Access</u>, by Linda Burkhart - a motor/cognitive guide to introducing switch access

★ **When you do something fast, you can only use motor skills that you have already developed to automaticity**

★ **You can not improve or refine your motor patterns without slowing down and attending to what you are doing**

★ **<u>Learning</u> switch access should not involve timing**

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Resources: Stepping Stones

**Stepping Stones to Switch Access, by Linda Burkhart
Published in Perspectives of the ASHA Special Interest Group – Augmentative and Alternative Communication, Copyright © 2018
http://lindaburkhart.com/index.php/handouts/**

**ATIA January, 2019 – Handouts:
Take the Timing Out of Switch Access, presented by Linda J Burkhart and Fio Quinn. ATIA, 2019
http://lindaburkhart.com/index.php/handouts/**

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This presentation also assumes a basic knowledge of <u>Stepping Stones to Switch Access</u>, by Linda Burkhart - a motor/cognitive guide to introducing switch access

- **Step 1: Single Switch - Cause and Effect**

- **Step 2: Single Switch - Multiple Locations and Multiple Functions**

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This presentation also assumes a basic knowledge of <u>Stepping Stones to Switch Access</u>, by Linda Burkhart - a motor/cognitive guide to introducing switch access

- **Step 3: Two Switches - Two Functions**

- **Step 4: Learning to Two Switch Step Scan (move, move, get)**

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Two Switches to Success
(Mind Express)
Move, move, get

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Steps 1-4 Resources:

Enabling Devices: enablingdevices.com

Inclusive TLC (switch skills for two):
www.inclusivetlc.com

Helpkidzlearn: helpkidzlearn.com

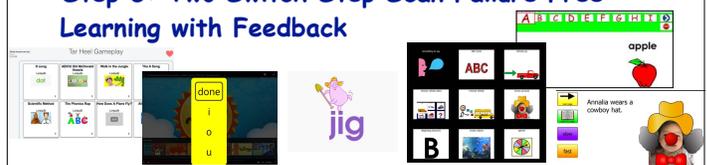Judy Lynn Software: www.judylynn.com

Mind Express / Steps Before Step Scanning:
www.star-at.com & mindexpress.be

RJ Cooper: rjcooper.com

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This presentation also assumes a basic knowledge of <u>Stepping Stones to Switch Access</u>, by Linda Burkhart - a motor/cognitive guide to introducing switch access

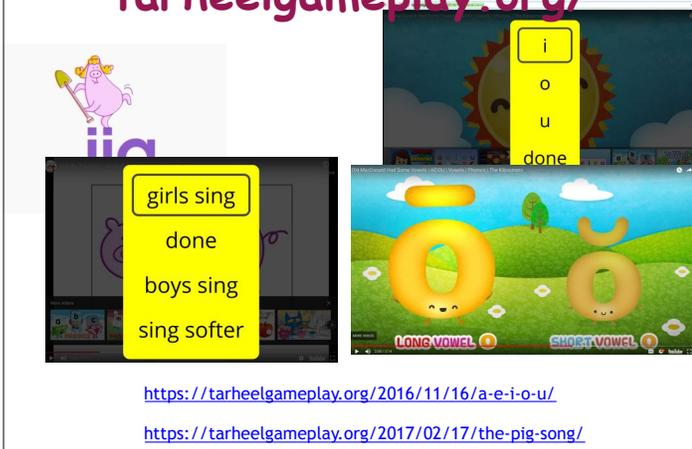- **Step 5: Two Switch Step Scan Failure Free Learning with Feedback**

- **Step 6: Two Switch Step Scan to a Target**

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tarheelgameplay.org/

https://tarheelgameplay.org/2016/11/16/a-e-i-o-u/

https://tarheelgameplay.org/2017/02/17/the-pig-song/

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This presentation also assumes a basic knowledge of <u>Stepping Stones to Switch Access</u>, by Linda Burkhart - a motor/cognitive guide to introducing switch access

- **Step 7: Practice for Increasing Accuracy with Two Switch Step Scanning**

- **Step 8: Two Switch Step Scan (automaticity)**

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Steps 5 - 8: Resources:

Attainment / GoTalk Now www.attainmentcompany

Boardmaker Studio: goboardmaker.com

CrickSoftware / Clicker: www.cricksoft.com/us

Mind Express / Switch Accessible Literacy Smorgasbord (under development):   www.star-at.com & mindexpress.be

Smartbox Grid3: thinksmartbox.com

Tarheel Game Play: tarheelgameplay.org

Widgit: https://www.widgit.com

Various companies that carry full communication software that is switch scannable with auditory cues

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Stability and Active Position Important Components

- **Work with OTs and PTs**
- **Begin with an active relationship with gravity at the pelvis**
- **Teach child to actively desire and participate in stabilizing and moving themselves (grasp bar, positioning aids)**
- **Learning to actively shift weight and stabilize**

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Keep in mind your goal - is it content or vision?

- Vision - reduce cognitive load and pay close attention to appropriate characteristics for that student

- Content - may need to reduce visual load and provide clear auditory content with more audio captioning as needed

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CVI Characteristics and How Technology Can Help

- Accommodate for visual challenges to access content

- Improve functional use of vision

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Light gazing or need for light (also light sensitivity)

- Manually adjust screen brightness - brighter or dimmer
- Consider a gray background or other soft color behind text instead of bright white
- Pay attention to glare on the screen and other lighting sources in the environment

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Visual field differences & Difficulty with distance viewing

- Physical position of screen
- Mounting options for optimal placement
- Splashtop, Team Viewer, Join Me - mirror computer screen on iPad/tablet to bring closer to child and position for best viewing

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Splashtop, Team Viewer, Join Me

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Color Preference

- In phase 1: color encourages looking
- In phase 2: color may indicate where to look and begin helping with discrimination
- In phase 3: color may help to call attention to salient features and details
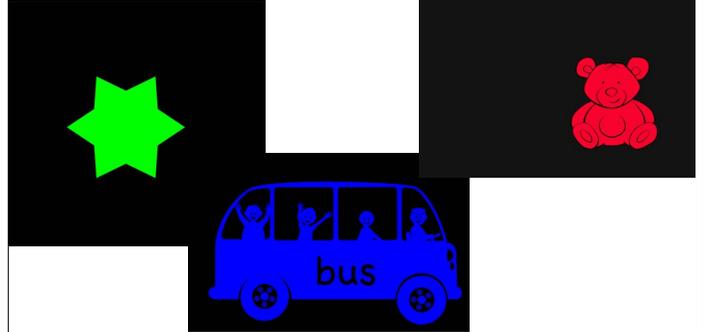- Use color based upon individual needs

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Phase 1: color encourages looking

- Bright colors
- Only one or a few colors
- Only one or a few targets
- Movement may enhance attention

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HelpKidzLearn
# Little Bear Sees (App)

- Big Bang Activities

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Phase 2: color may indicate where to look and begin helping with discrimination

- Bright colors
- Only one or a few colors
- Only one or a few targets
- Movement may enhance attention
- Highlight text with preferred color
- Navigational buttons with auditory scan and reduced visual complexity
- Symbols with simple bright colors that are easy to differentiate from other symbols
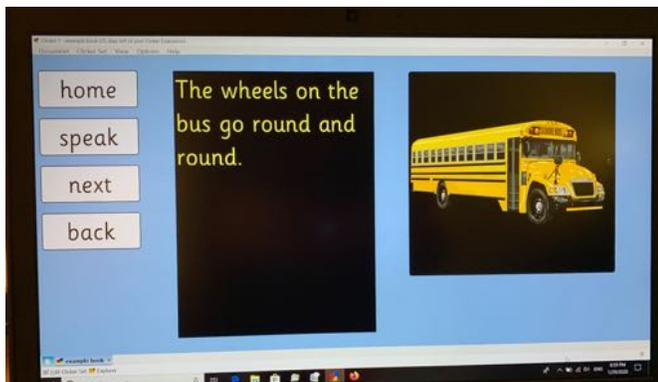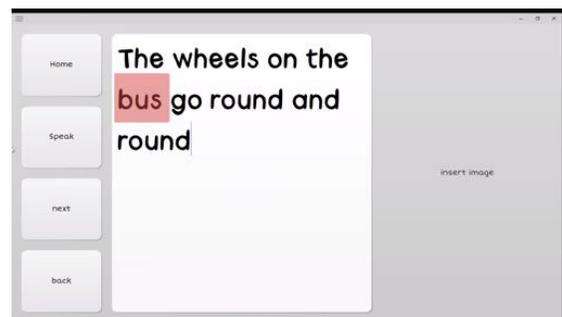
39

Widgit: SymWriter
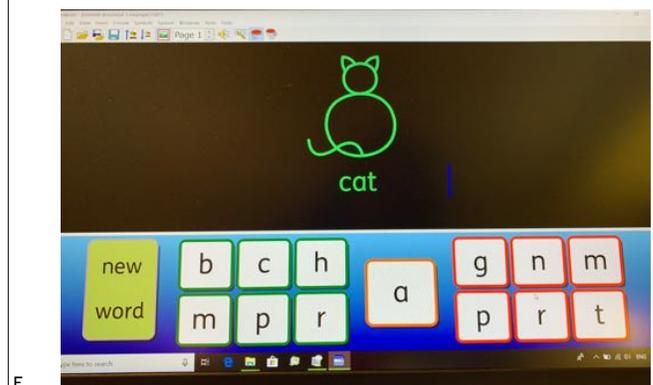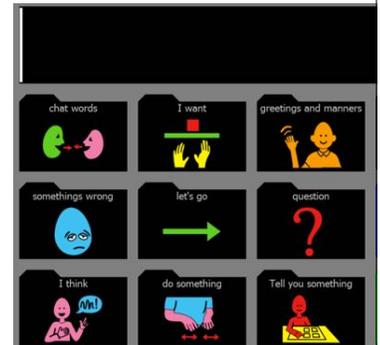

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CrickSoftware Clicker

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Reduce other colors

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Switch Accessible Literacy Smorgasbord
Failure Free Writing Activities
(Mind Express)

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PCS "High Contrast" Symbols

- Reduced complexity
- Highly differentiated from each other
- High color saturation
- Use with auditory scanning on communication software

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Switch Accessible Literacy Smorgasbord
(Mind Express)

- **Write with the alphabet**

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Phase 3: color may help to call attention to salient features and details

- Use preferred color for text on contrasting background
- Change highlight color
- Highlight salient features with preferred color
  - Video
  - Still pictures

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Switch Accessible Literacy Smorgasbord
(Mind Express)

- **Writing Valentines**

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Switch Accessible Literacy Smorgasbord
(Mind Express)

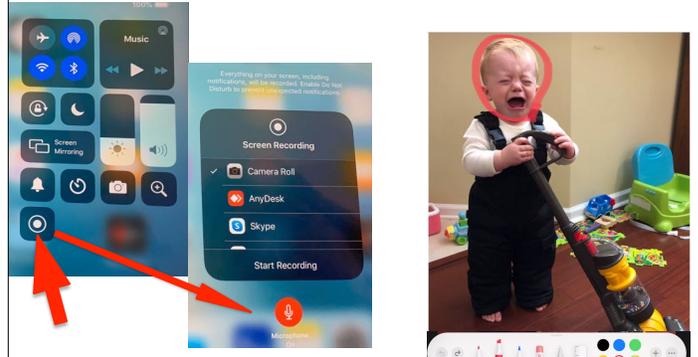- **Book with Auditory and visual supports**

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Explain Everything
(iPad, Android, Chromebook App)

Also screen record in newer iPad

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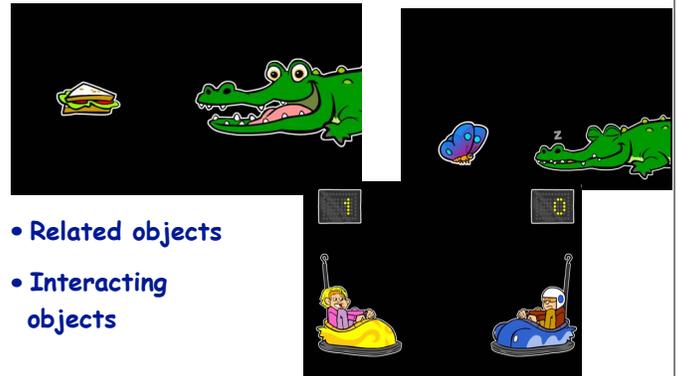## Screen Recording on
Newer iPads

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Need for movement
(with exception that some individuals do not see movement)

- **Simple graphics**
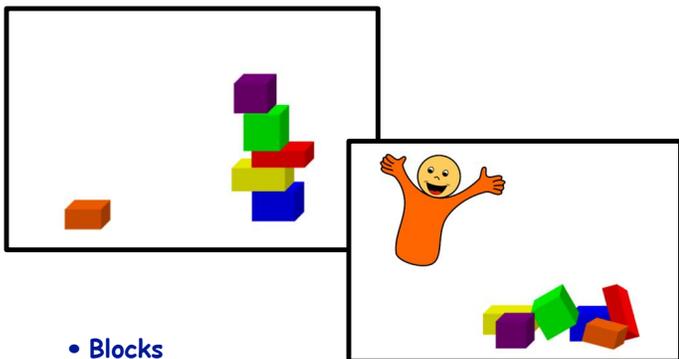- **Simple movement across screen**
- **Highlighting text being read**

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Inclusive TLC: Switch Skills
for Two - Set 1
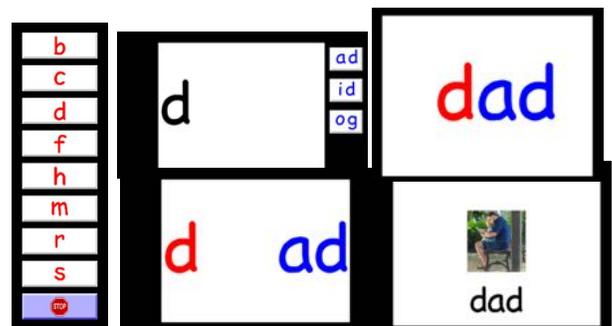
- **Related objects**
- **Interacting objects**

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Two Switches to Success
(Mind Express)

- **Blocks**

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Switch Accessible Literacy Smorgasbord
(Mind Express)

- **Make 3 letter words**

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Latency of visual gaze
(child may see better when expecting to see something)

- Give child the control to start activity / action
- Short sound to signal visual screen change to alert child to look (for example: page turn)
- Two switch step scanning access
- Create Launchers for student to select activity

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All Grid-type software

- Make a start page for an activity that allows the child to start the activity

click to start

Start >

Click to Start >

56

Switch Accessible Literacy Smorgasbord
(Mind Express)

spin

say it again

stop
STOP

one
1

three
3

two
2

- Game Spinner (waits for student to control action)

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Create Individual Student Launchers

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Launcher (Favorites) Tarheelgameplay

Tar Heel Gameplay

Choose Your Career!	O song	A E I O U	Walk in the Jungle
jakeandemmie	LindaJB	LindaJB	LindaJB
"this" this christmas	The A Song	Scientific Method	The Phonics Rap
jsedgwick	LindaJB	LindaJB	LindaJB
How Does A Plane Fly?	All About Sharks	"Hungry" very hungry caterpillar	Dora ABC Adventure
LindaJB	LindaJB	jsedgwick	LindaJB

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Choose a Video (launcher) (Grid 3)

download videos into your Windows video folder

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Difficulty with Visual Novelty

- Use templates that operate in the same or similar predicable manner when introducing new activities

- When the child is presented with a new activity, they will already be familiar with the user interface: Layout, interaction procedure, etc. They will then be able to focus on the content

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Switch Accessible Literacy Smorgasbord
(Mind Express)

- Make a Monster Book
- Dress up book

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2 Switch Step Scanning Activities to Select - Listen to and Read Books

https://drive.google.com/open?id=1f_eUAXrUdUSeWbv0Ib5GQq6j3pKPvAEN

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Switch Accessible Literacy Smorgasbord
(Mind Express)

- Study guide
- Book template
- Can be just text with limited or no pictures
- May include video or sound effects

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Listening Comprehension with Feedback (Mind Express)

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Listening Comprehension: Template

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Listening Comprehension with Feedback

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Listening Comprehension with Feedback

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Complexity:

- Environmental complexity
- Complexity of auditory plus visual input
- Number of items, color, unfamiliar items in an array distance between items
- Complexity of visual motor
- Complexity of faces

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Environmental complexity

- Competition with other senses
- Student control of starting and continuing activity and actions within activities
- Position of screen in relation to distractions in the environment

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Complexity of auditory plus visual input

- Looking and listening at the same time may be challenging
- Try short sound to alert attention and then provide visual movement without sound
- Build expectation that something will happen and then provide visual response without sound
- Turn off computer sound
- Allow for student led repetition of auditory and/or visual content (read it again) (I don't know, read it again)

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Two Switches to Success
(Mind Express)
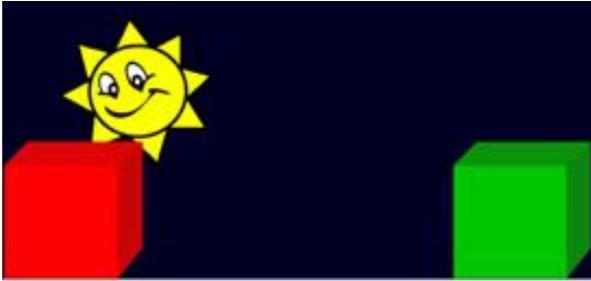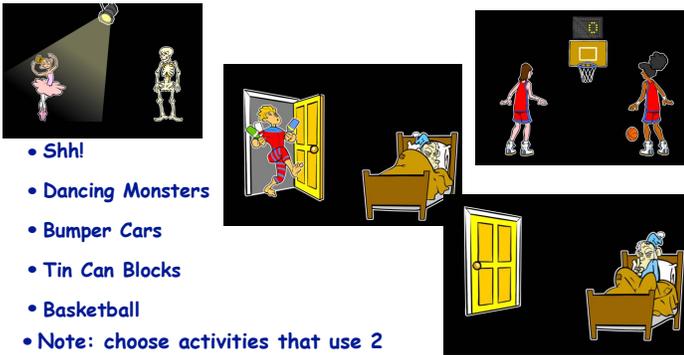

- Hide and Find (turn off moving sounds)

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Complexity of Visual Array

- Number of items
- Number of colors
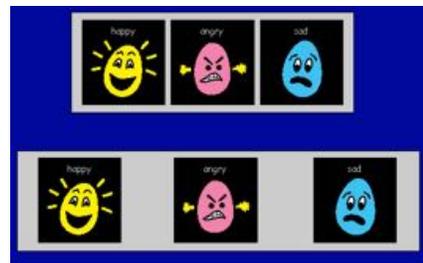- Number of unfamiliar items in an array
- Space between items

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HelpKidzLearn - Two switch two function activities and
Inclusive TLC: Switch Skills for Two (set 1&2)

- Shh!
- Dancing Monsters
- Bumper Cars
- Tin Can Blocks
- Basketball
- Note: choose activities that use 2 switches with no timing

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Space between items reduces complexity

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Complexity of Faces

- Use simple graphics (talking heads may be too complex)
- Understand the individual's ability to recognize faces when selecting graphics. Use graphics that elicit attention and interest (customize face pictures to the individual child)
- Provide audio descriptions and audio captioning. (Individuals may not be able to discern facial expressions that often give clues to text and assist comprehension in books)

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Two Switches to Success
(Mind Express)
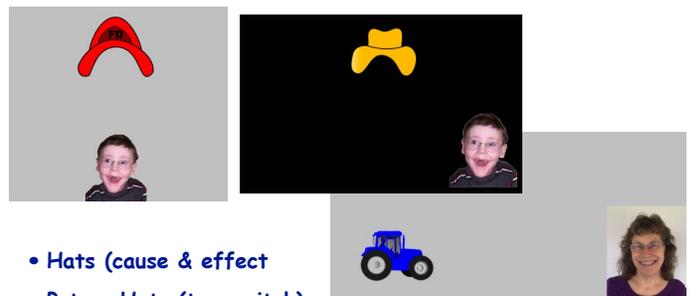
- Hats (cause & effect
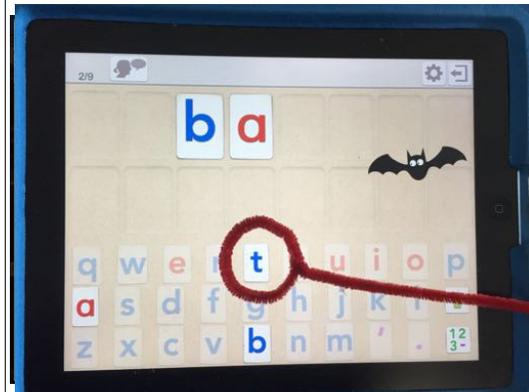- Put on Hats (two switch)
- Vehicles (move, move, get)

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Complexity of visual motor

- Consider environmental placement around the switch to reduce complexity

- When using switches is still being learned, try Partner-Assisted Scanning as a no-tech strategy

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Partner Assisted Scanning on Apps - such as Word Wizard

- pipe cleaner wands

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Contrast sensitivity (Dutton)

- Acuity may be affected by specific brain damage
- Consider thickness of lines and size and boldness of text
- Contrast text on background

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*Keep in mind your goal - is it content or vision?

- Vision goal? - reduce cognitive load and pay close attention to appropriate visual characteristics for that student

- Content goal? - may need to reduce visual load and provide clear auditory content with more audio captioning as needed

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*Please fill out Evaluation in the ATIA App

Linda Burkhart
linda@Lburkhart.com

Fio Quinn
mfquinn@srt.com

HANDOUT

www.LBurkhart.com

Approved CEUs: ACVREP (General & ATBVI);AOTA;ASHA;IACET

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