

Visual Impairment Program

# Working with Students with Visual Impairments and Blindness

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Clinical Assistant Professor

The background of the slide is a smooth gradient that transitions from a solid red color on the left side to a solid white color on the right side.

# **AN INTRODUCTION VISUAL IMPAIRMENTS AND BLINDNESS**

# The Face of Blindness

- 50-90% of children with blindness also have at least one additional disability
  - Medical advancements have allowed for children to survive who are born extremely premature and with complex medical needs
  - Many are non-readers
  - Less than 10% use braille as their primary reading medium
- The majority of students with blindness are educated in mainstream classrooms
  - Schools for the blind have had to reinvent themselves
    - Outreach
    - Short course
    - Summer/weekend programming



# Blindness 101

- Don't yell
- Always introduce yourself
- Don't assume the person who is blind needs help
- Be cautious of terminology that uses visual references



# This, That, and There

- Sighted people often talk only to bring attention to visual information.

“It’s **his** turn,” (point and/or gaze at student.)

“It’s about **this big**,” (gesturing.)

“It’s over **there**,” (pointing.)



# This, That, and There

- Instead say:

“It’s **Johnny’s** turn.”

“It’s about **the size of a basketball.**”

“It’s located **to the right of the white board.**”



# Human Guide

- When offering assistance to someone who is blind or visually impaired, use human guide:
- [How to Walk with a Guide by Vision Aware \(photos by Dona Sauerburger\)](#)



# Common Vision Problems

- **Cortical/Cerebral Visual Impairment**

CVI is a condition that indicates that the visual systems of the brain do not consistently understand or interpret what the eyes see.

- **Retinopathy of Prematurity**

RoP is the disorganized growth of retinal blood vessels which may result in scarring and retinal detachment.

- **Optic Nerve Hypoplasia**

ONH is a condition involving the underdevelopment of the optic nerves that commonly occurs as a result of congenital optic nerve anomaly. I

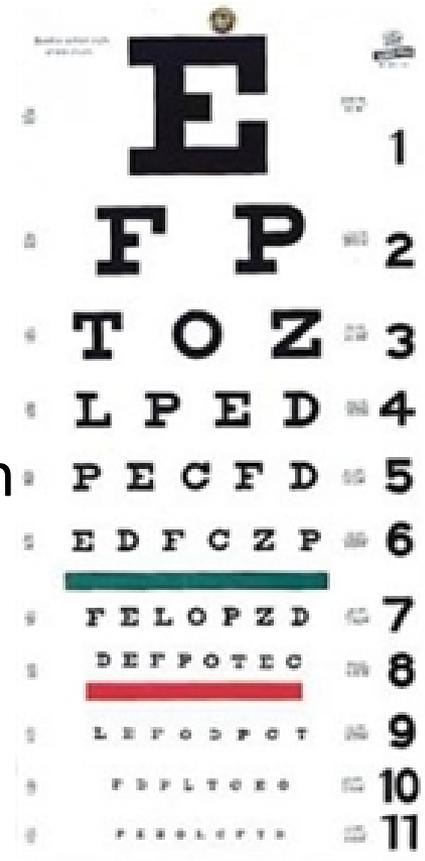
- **Retinitis Pigmentosa**

RP is a rare, inherited disease in which the light-sensitive retina of the eye slowly and progressively degenerates. Eventually, blindness results. There is a large population of people with RP in Kentucky.



# Understanding Vision Loss

- Legally Blind
  - 20/200 in the better eye, with correction, or
  - A field restriction of 20 degrees or less
- Qualifying for services in the schools
  - 20/70 in the better eye, with correction
  - Field restriction of 20 degrees or less
  - Deteriorating eye condition
  - A functional loss
  - Adversely impacts educational performance



# Simulator Goggles

Here is your chance to get a great photo of your colleagues!



Or visit:

<http://www.inclusivedesigntoolkit.com/betterdesign2/simsoftware/simsoftware.html>

<http://youtu.be/DwtH1mO4eE0>



# CVI Characteristics

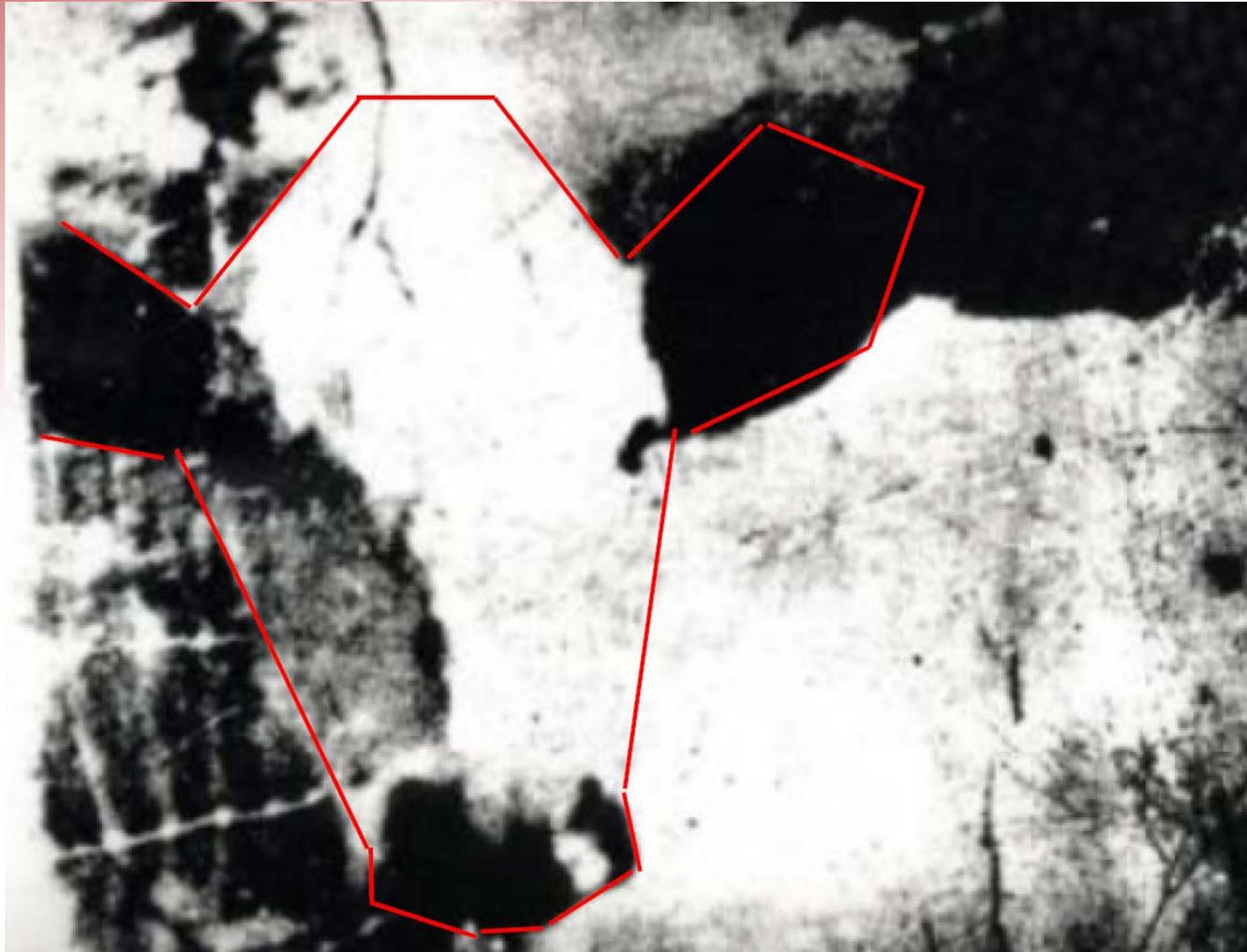
- Color preference
- Need for movement
- Visual latency
- Visual field preferences
- Difficulties with visual Complexity
- Light-gazing and nonpurposeful gaze
- Difficulty with distance viewing
- Atypical visual reflexes
- Difficulty with visual novelty
- Absence of visually guided reach



# Can You SEE the Image?



# Can You See It Now?



# The Impact of Vision Loss...

- The impact of vision loss on concept development is monumental
- Nearly 90% of what we learn is visual, much of which is incidental
- This means young children with blindness and visual impairments are missing a lot!
- Activity: Can you describe a cow???



# Incidental Learning

Learning through imitation



What concepts are being learned in these photos?

# The Role of the TVI

- Complete a Functional Vision Learning Media Assessment
- Develop IEP goals and monitor progress
- Make modifications to the environment and curriculum
- Teach the Expanded Core Curriculum for the Blind and Visually Impaired



# The ECC

## The Expanded Core Curriculum for the Blind and Visually Impaired:

- **Compensatory and functional academic skills, including communication modes**  
Compensatory skills involve the adaptations necessary for accessing the core curriculum, which can include: braille, tactile symbols, sign language, and recorded materials.
- **Orientation and Mobility**  
Skills to orient children who are visually impaired to their surroundings and travel skills to enable them to move independently and safely in the environment. This is taught by a Certified O&M Specialist.
- **Social Interaction Skills**  
Since nearly all social skills are learned by observation of the environment and people, this is an area where students with vision loss need careful, conscious and explicit instruction.
- **Independent Living Skills**  
This area includes the tasks and functions people perform in daily life to optimize their independence - skills such as personal hygiene, food preparation, money management, and household chores.



# The ECC Continued

- **Recreation & Leisure Skills**  
Skills to ensure students' enjoyment of physical and leisure-time activities, including making choices about how to spend leisure time.
- **Career Education**  
Students with vision loss benefit most from an experiential learning approach. Structured visits to community sites and discussions with people who perform various jobs, enable them to understand concepts and specific skills that are needed to be successful in those jobs. Considering the national rate of unemployment or underemployment of working-age adults who are blind is 70% -75%, this area needs attention throughout the school years to help students with vision loss develop marketable job skills.
- **Assistive Technology**  
Assistive technology is a powerful tool that can enable students with vision loss to overcome some traditional barriers to independence and employment.
- **Sensory Efficiency Skills**  
Skills that help students use the senses – including any functional vision, hearing, touch, smell, and taste – to access skills related to literacy and concept development.
- **Self-Determination**  
Skills to enable students to become effective advocates for themselves based on their own needs and goals.



# **MODIFYING THE ENVIRONMENT TO ENHANCE VISION**

# Environmental Modifications

- Color
- Contrast
  - Use a sheet, cloth, or shelf liner
- Glare
- Reducing clutter
  - Keep it simple!
- Lighting
- Distance
- Be consistent (don't frequently rearrange the environment)



# Visual Complexity

Students may recognize the toothbrush and toothpaste separately, but not when they are on top of each other.





Visual Complexity



# Visual Complexity



# Environmental Modifications

- Avoid cluttered background and over stimulating classrooms
- Make sure the child is not facing windows



# Modify Yourself Too!



# Seating and Position

- Proper seating should support the head and neck, allowing children the ability to focus on using their vision.



# **ACCESS TO ACCESSIBLE MATERIALS**

# Accessing Materials

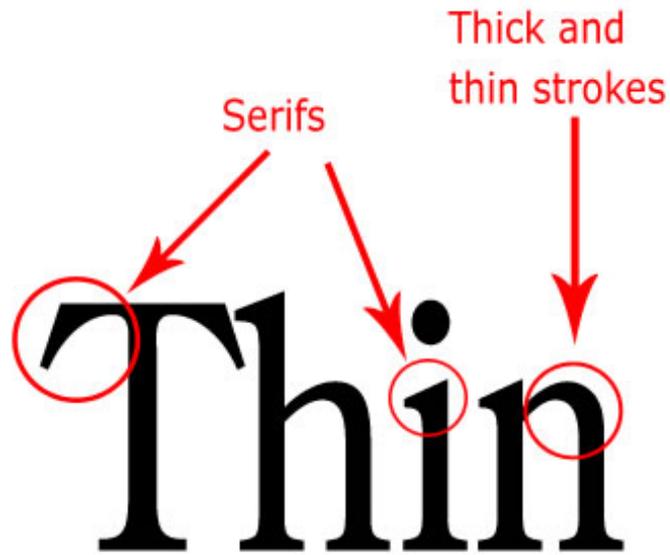
- Large print (including electronic books)
- Braille
- Auditory

Reading something to a student is not the same as reading it themselves (print or braille). Developing readers must have hands-on access to reading materials to gain literacy skills!



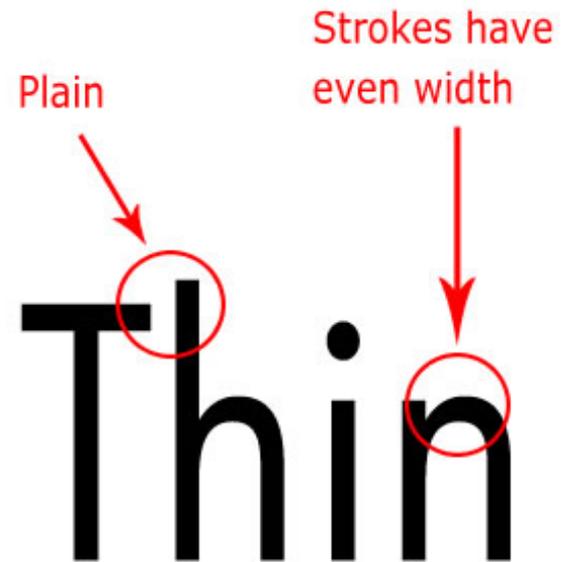
# Font Sizes and Types

## Serif Font



Century Old Style

## Sans Serif Font



Futura Book



# Serif Fonts

“Serifs” are the small finishing strokes on the end of a character.

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Times New Roman

Palatino

Georgia

Century



# Sans Serif Fonts

“Sans serif” fonts do not have these small finishing strokes.

The term comes from the French word *sans*, meaning "without"

Calibri

Veranda

Tahoma

Arial



# Compare the Difference

The quick brown fox jumps over the lazy dog.

The quick brown fox jumps over the lazy dog.



# Point size?

type type

*left: Times; right: Helvetica*  
Both are the same point size

16pt Arial 16pt Perpetua

The point size of a typeface is not the same as its apparent size



# APHont

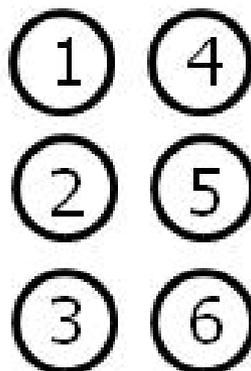
- APHont™ (pronounced Ay'-font), was developed by APH specifically for low vision readers. APHont embodies characteristics that have been shown to enhance reading speed, comprehension, and comfort for large print users.

[Download free-of-charge to qualified users for non-commercial purposes](#)



# Braille 101

## The Braille Cell



# The Braille Alphabet & Numbers



a b c d e f g h i j

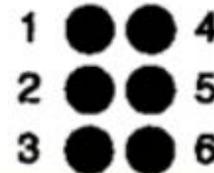


k l m n o p q r s t



u v w x y z

The Braille Cell



1 2 3 4 5 6 7 8 9 0

SPLASH



# Contracted Braille

- Braille contractions are like “shorthand”. They allow for common words and letter combinations to be brailled using fewer braille cells. There are 180 of them.

and      (and)      ⠠⠠⠠

Portland      Portl(and)      ⠠⠠⠠⠠⠠⠠⠠⠠

think      (th)(in)k      ⠠⠠⠠⠠⠠

tomorrow      tm      ⠠⠠



# Test Your Braille Skills?

Can you braille your name?

Donna

⠠⠳⠗⠠⠠⠠⠠⠠⠠

Hint: Use a dot 6 before the letter you want to capitalize



# iOS - Universal Design

- Your iOS device has many helpful features built into it that can assist users with visual impairments. To access these features go to:
  - Settings → General → Accessibility



# iPad Accessibility Options

- VoiceOver Screen Reader (do NOT turn on unless you know the gestures!)
- Zoom Screen Enlarger
- Magnifier (Acts like a handheld magnifier)
- Adjust the text size and type
- Turn on speech
- Change contrast
- Interaction controls
- Turn on Guided Access (Limits the usage)



# Worksheets on the iPad

Two great worksheet options for low vision are:

- [Notability](#)



- [GoWorksheet Maker](#)



**GoWorksheet  
Maker iPad App**

Quickly convert any printed  
worksheet into a digital activity!



# Electronic Books



Tar Heel Reader - a collection of free, easy-to-read, and accessible books on a wide range of topics.

<http://tarheelreader.org/>

Power Talk – free download, makes PowerPoint talk

<http://fullmeasure.co.uk/powertalk/#downloads>



# Electronic Books on the iPad

- Keynote
- PowerPoint
- iBooks
- Search Paths to Technology for iBooks
  - <http://www.perkinselearning.org/technology>

- Book Creator
- Story Creator (free)
- PictureTalk



**COMMUNICATION**

# Hand-Under-Hand

Hand-Under-Hand is the preferred method to guide a student's hands in exploration or to demonstrate a fine motor skill. DO NOT grab a student's hands and manipulate them!

Resources:

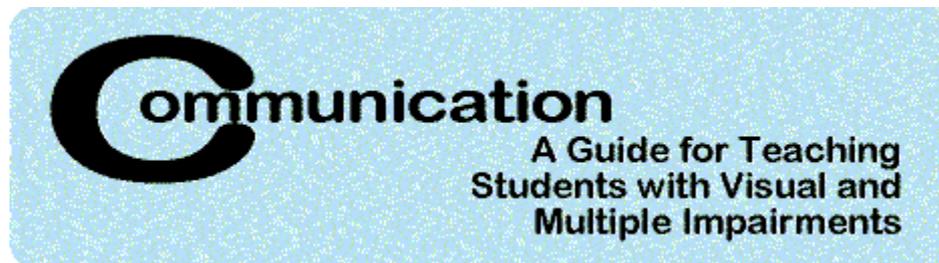
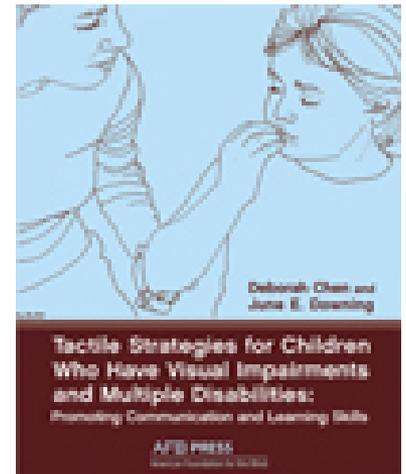
- [TSBVI](#)
- [Georgia Sensory Assistance Project](#)



# Communication Resources

## Resources

- [Tactile Strategies for Children Who Have Visual Impairments and Multiple Disabilities: Promoting Communication and Learning](#)
- [Tactile Learning Strategies](#) (video)
- [Communication](#) (book from TSBVI)



# Selecting Symbols

What symbol would you use for a car?



# Rethinking Tactile Symbols

- Objects must be meaningful
- Abstract symbolic representations may not be meaningful. For example, a matchbox school bus or car does not have anything to do with their own experience of riding in a bus or car. A more appropriate object might be the buckle of a seatbelt,
- It takes a team approach



# Federal Quota Funds

- Federal Quota Funds is money allocated for specialized materials from the American Printing House for the Blind (APH) for students who are legally blind.
- Contact your TVI to obtain materials with quota funds.
- Learn more at: <http://www.aph.org/federal-quota/>
- Many of the products shown in the presentation are available from APH using quota funds.



# Creating Object and Tactile Supports

Products available from APH on Federal Quota



**SAM: Symbols and Meaning Kit**

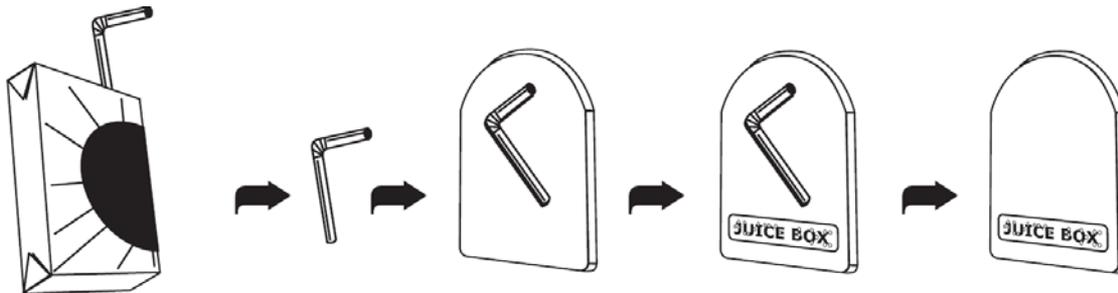


**STACS: Standardized Tactile Augmentative Communication Symbols Kit**

# Hierarchy of Abstraction for Students who use Tactile Symbols

- Whole object
- Piece of object
- Piece of object mounted
- Piece of object on card with label
- Label only

• Taken from APH Tactile Connections Symbols for Communication



# Creating a Tactile Schedule

Products available from APH on Federal Quota



**Tactile Connections Kit:  
Symbols for Communication**



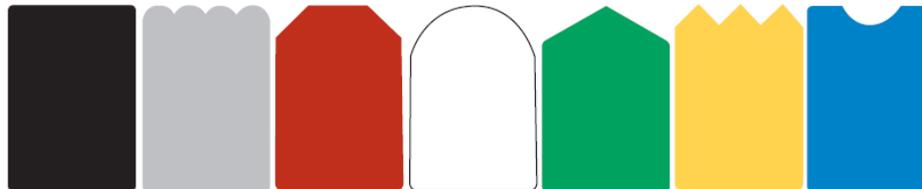
**Example**



**Expandable Calendar Boxes**

# Card Category and Shapes

- Person = yellow crown shape
- Place = red barn shape
- Action = green house shape
- Time = blue puzzle shape
- Object = white bread shape
- Expression = black rectangle shape
- Expansion = gray scalloped shape



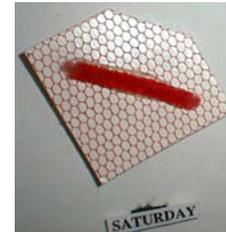
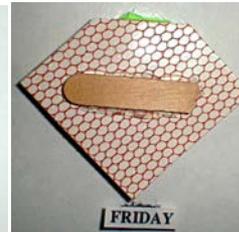


**Meaning Category: Time**

Backing Shape: **Diamond with clipped top**

Background Texture: **Net**

[Tactile Symbols Directory to Standard Tactile Symbol List](#)



**Meaning Category: Events**

Backing Shape: **Rectangle**

Background Texture: **Acetate (satin)**



Camping



Birthday



AstroWorld

**Meaning Category: PLACES**

Backing Shape: **Square**

Background Texture: **Needlepoint backing (vinyl grid)**

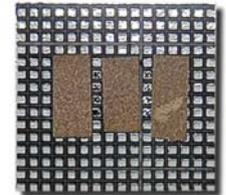
**Places at school**



OFFICE



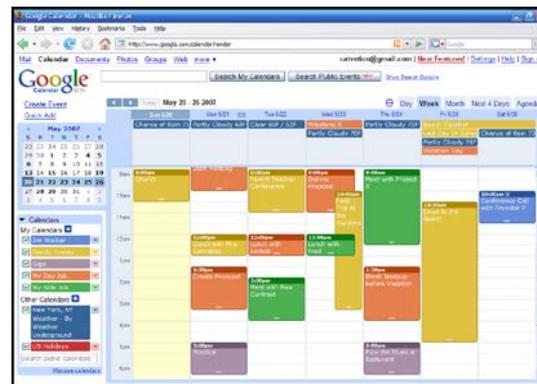
GYM



School

# Calendar and Schedule Systems

- What do we know
- What are your experiences
- What type of Calendar system/s do you use
- How do you access your schedule?



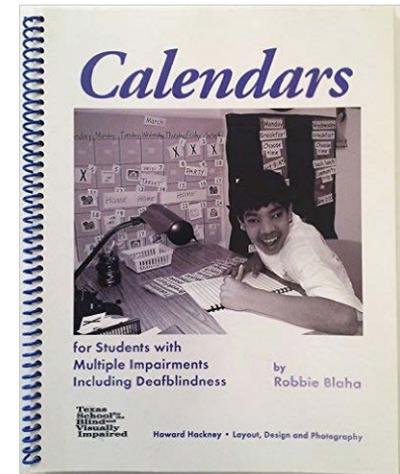
# What is a Calendar Box or Anticipation Calendar?

- Calendar boxes provide a way to help children with additional disabilities anticipate what will happen in their day.
- Objects of reference are used and arranged in left to right sequence in the order in which activities take place.
- <http://www.pathstoliteracy.org/blog/calendar-boxes-and-schedule-systems-literacy-tools>



# Who Can Benefit?

- Students with
  - Visual and Multiple disabilities
  - Dual sensory loss (deafblindness)
  - Autism
  - Any student who needs structure and routine
  - -from: *Calendars for Students with Multiple Impairments Including Deafblindness* by Robbie Blaha, available from TSBVI
- Let Me Check My Calendar (great resource article)
- <http://www.tsbvi.edu/seehear/archive/Let%20Me%20Check%20My%20Calendar.htm>
- Handout - [Using Tactile Symbols to Enhance Communication](#) (Texas Deafblind Project)



# How is a Calendar System Used?

- Build in time to check the schedule box before and after each activity.
- Always use left to right
- Avoid verbal clutter
- Some children need to take the object or symbol with them to the activity.
- Once the activity has been completed, the student and teacher carry the object back to the calendar box and place it in a special "finished" box to the right of the other boxes, saying and signing "finished". They then take the next object out of the next box and repeat the process.



# Calendar Box Resources

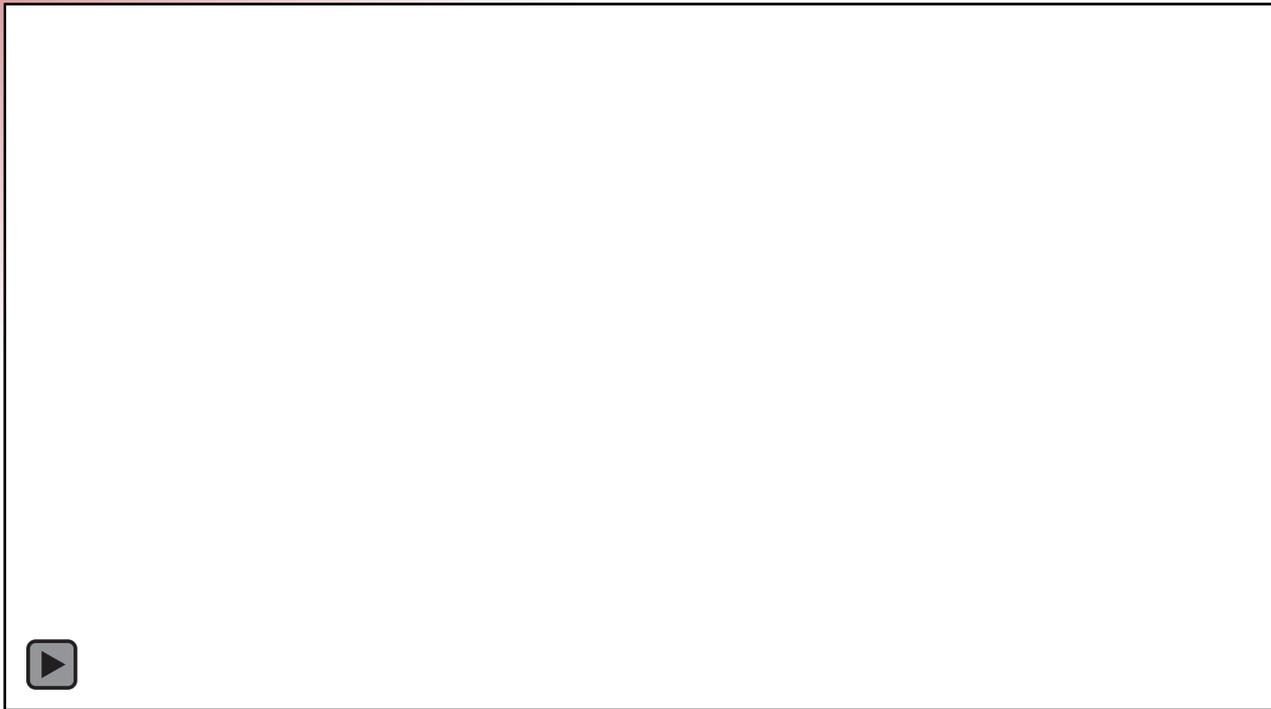
- How to Make a Calendar Box



- TSBVI Outreach VI Consultant Scott Baltisberger demonstrates how to make a cardboard calendar box
- <http://library.tsbvi.edu/Play/218>



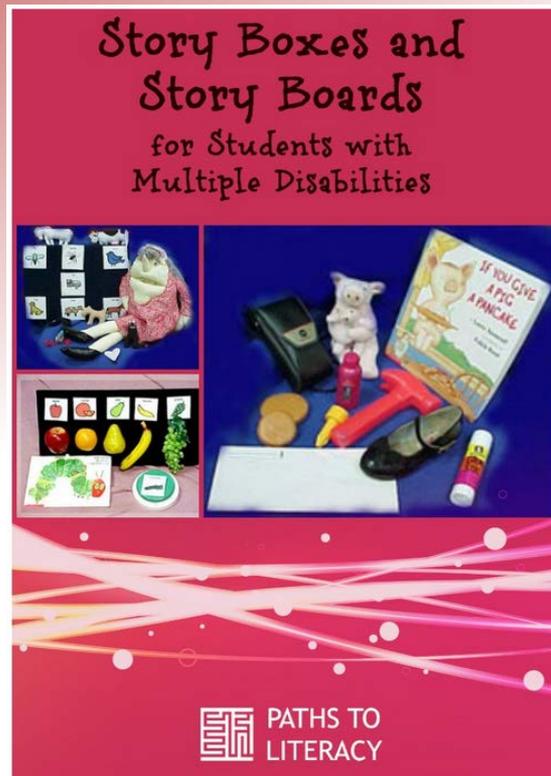
# Using A Tactile Calendar System



- <https://www.youtube.com/watch?v=oP8WOPVZazg>
- 1:27 min



# Paths To Literacy



“A **story box** is a simple collection of objects that go along with the storyline. The objects act like pictures to a blind child. They can make a story become alive and interactive for those students, that don't benefit from pictures.” -Deirdre Walsh, Speech and Language Pathologist, Perkins School for the Blind

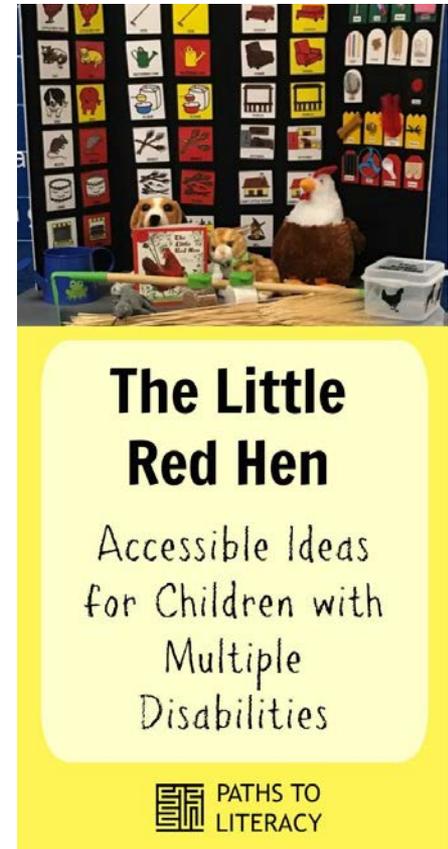


<http://www.pathstoliteracy.org/story-boxes-and-story-boards-students-multiple-disabilities>



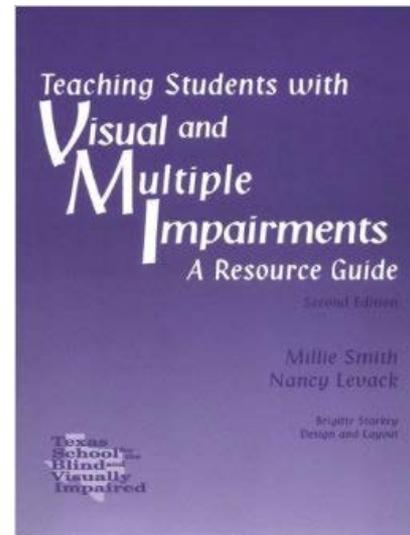
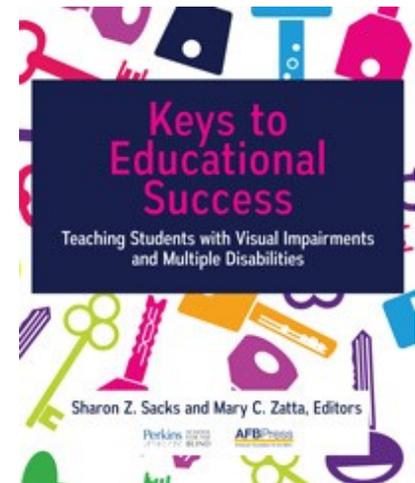
# Paths to Literacy

- Multiple Disability Resources:  
<http://www.pathstoliteracy.org/topic/multiple-disabilities>
- Example: The Little Red Hen:  
<http://www.pathstoliteracy.org/strategies/little-red-hen-accessible-ideas-children-multiple-disabilities>
  - Includes:
    - Story box
    - Picture communication symbols
    - Tactile communication symbols
    - Talking book
  - Look for all the stories completed by the University of Kentucky students!



# Noteworthy Publications

- [Keys to Educational Success](#)
- [Teaching Students with Visual and Multiple Disabilities](#)



# Kentucky Deaf-Blind Project

Dr. Donna Snyder, State Coordinator

<https://education.uky.edu/kydbp/>



# **MODIFICATIONS FOR ELEMENTARY MATH MATERIALS**

# General Modifications

Adaptations for:

- Unifix cubes
- People counters
- Color tiles
- Base Ten Blocks



# Work-Play Trays

- Provide boundaries so items don't move around



APH Work-Play Trays  
with dividers  
(Small)



# Visual Adaptations

- Consider color and contrast



# Two Color Counters

Original Item



Instead use

- APH Tactile Tokens



# Play Money

Original Item



Instead use

- Real Coins



- Fold each paper bill differently

# Money Identifiers

## iBill Currency Reader

- Free to individuals who are legally blind. Get more information at:  
<https://www.moneyfactory.gov/uscurrencyreaderpgm.html>



## iOS Apps

- NantMobile Money Reader



- EyeNote (free)



# Ten-Frame Magnetic Board

## Original Item



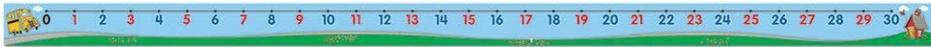
## Instead use

- APH Graphic Art tape to make the lines raised



# Walkable Number Line

## Original Item



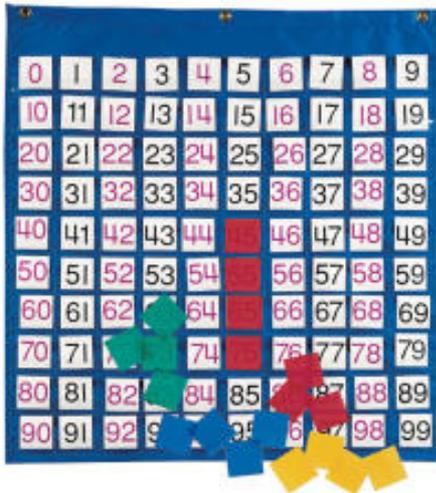
## Instead use from APH

- Stick-On Number Lines
- Consumable Number Lines
- Number Line Device



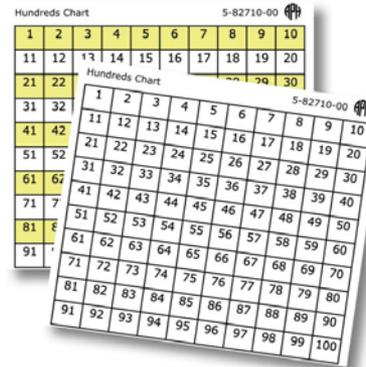
# Wall Size Number Chart

Original Item



Instead use

- APH Hundreds Chart
- APH Hundreds Board



# Circular Fraction Tiles

## Original Item



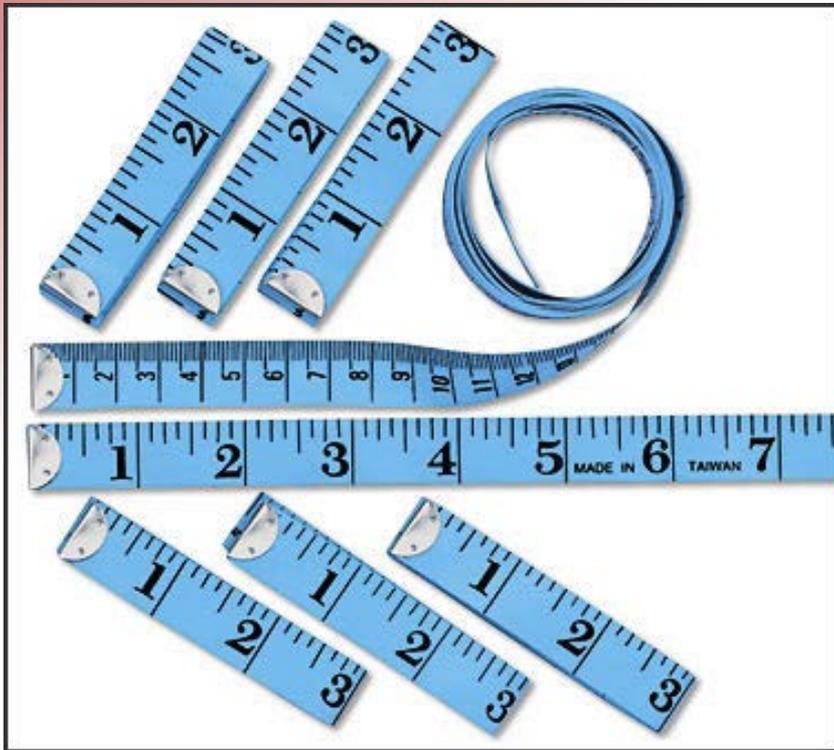
## Instead use

- APH Fractional Parts of Wholes Set
- Math Builders Unit 7



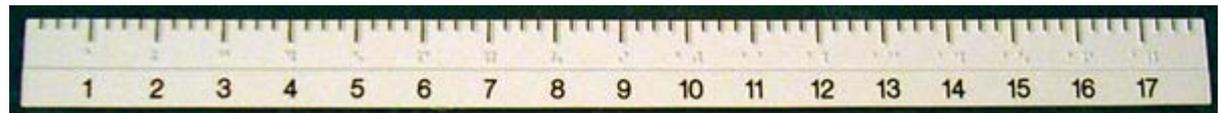
# Measuring Tapes

## Original Item



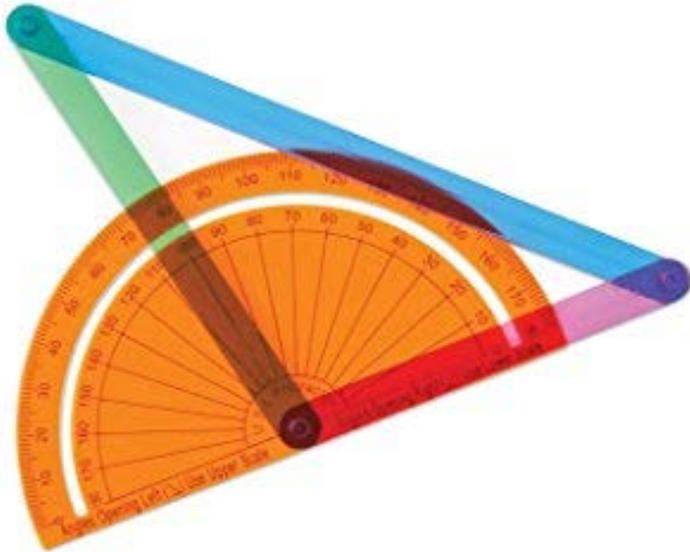
## Instead use

- APH Tactile, Braille, or Large Print Rulers
- [Tactile Caliper](#)



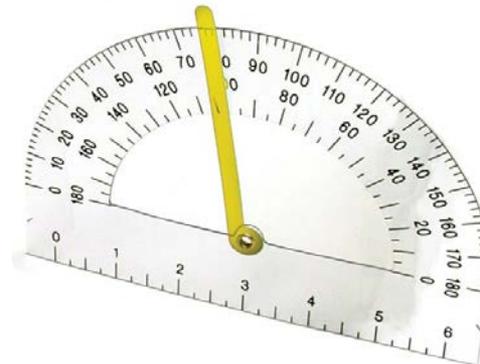
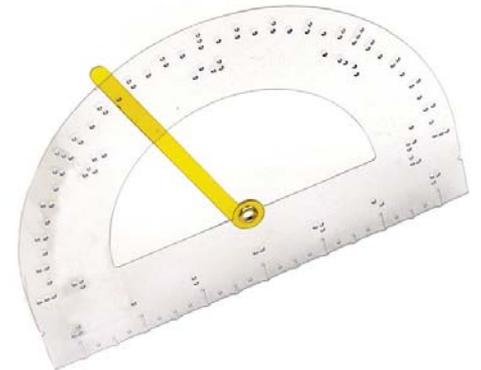
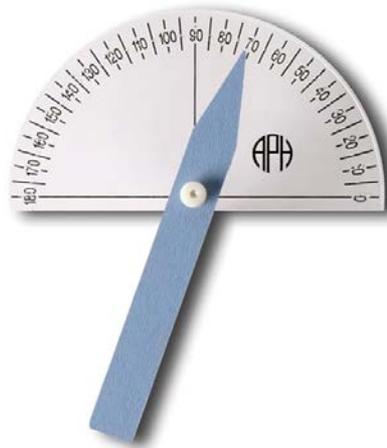
# Angle Legs

Original Item



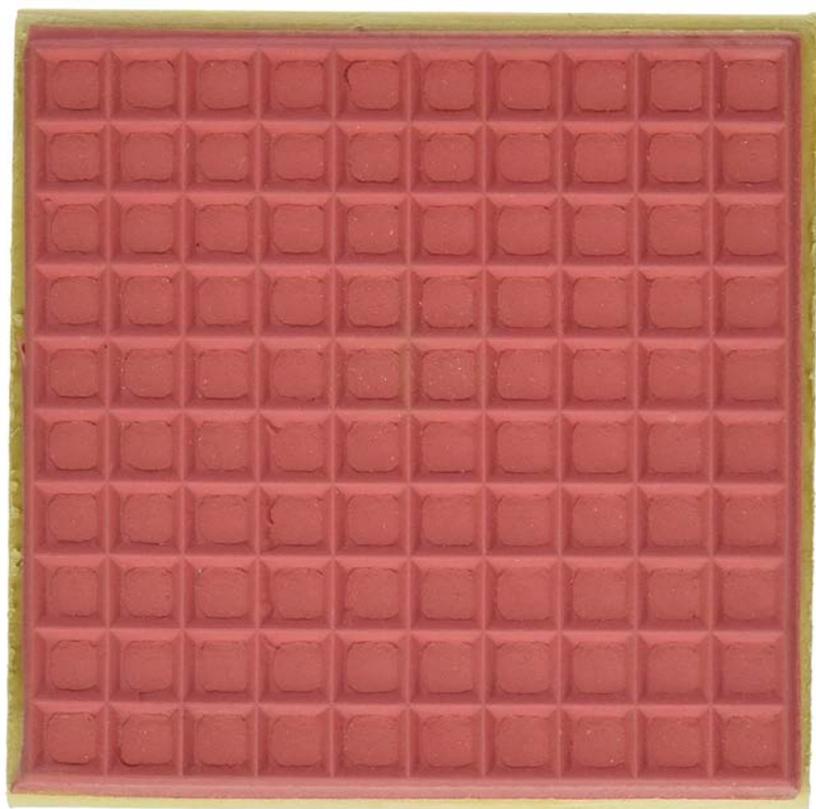
Instead use

- APH Protractors



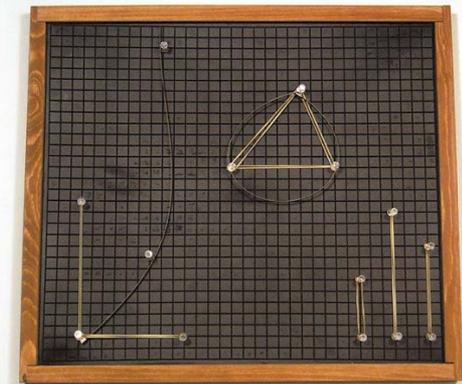
# Coordinate Grids

## Original Item



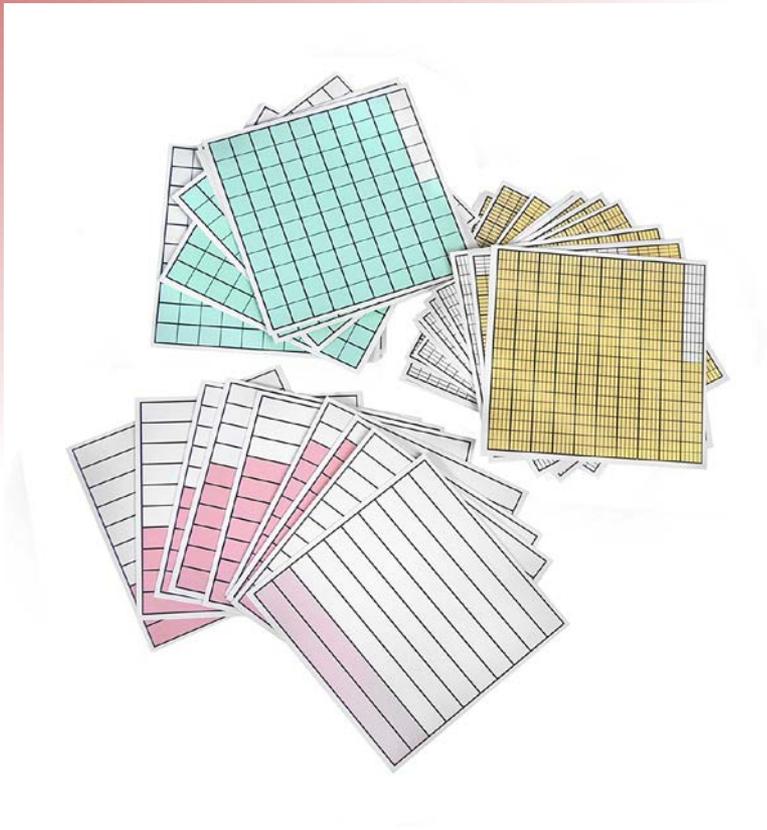
## Instead use

- APH Hundreds Board
- APH Graphic Aid for Mathematics



# Decimal Squares

Original Item



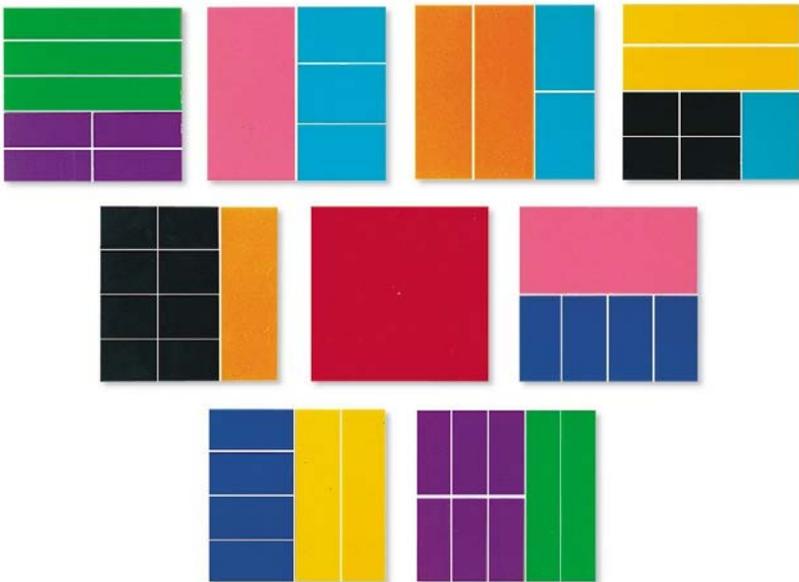
Instead use

- Math Builders Unit 7



# Fraction Models

Original Item



Instead use

- Math Builders Unit 7





# Overhead Materials

- Low vision students may benefit from using overhead materials with a light box (APH mini-light box shown).



# Questions???

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