

**GRADUATION:  
The Measure of Tomorrow**

**Picture that 1 student  
after high school**

My lesson today is \_\_\_

PUBLIC SCHOOLS OF NORTH CAROLINA  
State Board of Education | Department of Public Instruction

**November 18-20, 2015**

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**Focus on Low Vision:  
What's my next lesson?**

North Carolina Low Vision Institute  
Cynthia Bachofer, PhD, CLVT, CTVI  
Greensboro, NC, November 2015

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**Case Study: Cindy**

- Etiology: ROP (retinopathy of prematurity), 20/80 distance acuity; fulltime glasses wear; following retinal detachments and multiple surgeries lost vision in left eye in mid-20s
- Childhood: Academically successful; strong messages of self-reliance in family; 4 siblings; never quite keeping up
- Teenage years: Theater club & forensics instead of driving and dating; frustration with information just beyond visual reach
- Tools & Strategies: Optical devices user, customize view on computer; observe others on travel
- Challenges: the social scene (flirting is eye contact) managing transportation; balance reading vs. fatigue

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## Overview of Presentation

- Self-identity as a person with low vision seen as a process
- Range of tools and strategies to increase visual independence
- Instruction in building skill and confidence with devices (near & distance)

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## Unique Characteristics of the Student: Challenges and Opportunities

- Variable nature of low vision
- Natural curiosity and motivation
- Tendency to “pass” as typically sighted
- Visual efficiency skills within the individual
- Fluctuation in quality and clarity of what they see
- Reliably integrating sensory signals
- Ability to preview/anticipate visual cues

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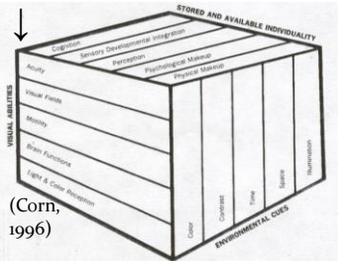
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## Accounting for Individuality

H (height) Visual Abilities

W (width) Individuality

(stored & available) ↔



L (length) →  
Environmental Cues

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## Accounting for Individuality

- Visual Abilities
  - Etiology/prognosis
  - Acuity/Visual fields
  - Stamina, speed, and comfort
- Adjusting to Environment
  - Knowing and setting preferences
  - Managing less favorable conditions
- Individuality
  - Age/developmental level
  - Past experience
  - Student's goals (\*and family)

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## What, who, how, and why

- What are optical devices?
  - Devices for near tasks (glasses & magnifier)
  - Devices for distance tasks (monocular/telescope)
  - Prescribed by a low vision specialist (e.g., optometrist)
- Who can benefit from using a device?
- How do they work?
  - Finding my target
  - Finding the sweet spot of focus
- Why does a student use a device?

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## Visual independence is ...

making the conscious decision to rely on personal *skills* to access visual information.



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## Rationale for device use to increase independence and literacy

- Immediacy of information
- Control over the visual environment
- Access to standard print & non-print
- Increased literacy skills
- Improved employability
- Convenience



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## The Three Ms

- Motivation to use
- Matching the user to the device
- Managing the task successfully
  - Confidence (internal sense)
  - Efficiency, speed (skill)
  - Responsibility



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## Motivation

- High expectations
- High interest
- High success



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## Matching the user to the device

- Power, distance, size
  - What's my power? (3x/12D mag; 6x16 scope)
  - How far away and how big is my target?
- Concepts of magnification
  - Relationship between the device lens and field of view (field of view = ease of use)
  - Importance of work distance (E↔L↔M)
    - Eye to lens
    - Lens to Material
- More light or less light

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## Managing the Task-Learning Centers

- 4 Learning Centers
  - Reading pages of print
  - ILS (home, community)
  - Charts, maps, documents
  - Using telescopes
- Guidelines and Goals
  - Give your best effort
  - Increase device awareness
  - See your student's world
  - Bring questions/comments

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Comments...

Questions...




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## Building skill in using optical devices




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## A Day in the Life. . .

- Cooking directions on food packages, nutritional info, appliance dials/switches
- Info in the mail, catalogs, official forms, itemized bills (and books)
- Buttons on remote control or tech “gadgets”
- Detail tasks: repairing a necklace, gluing something, painting fingernails, craft projects
- Menus, business flyers (gym schedule), weekly ads, receipts/bills, point-of-sale signature screen
- Bus schedules, route map
- Job-related forms, group project work, copier/phone

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## Terminology

- **Localizing:** Visually selecting an object from objects around it such as seeing the brand logo to the left of words.
- **Focusing:** Bringing an image into clearest view by adjusting the distance of the lens on your device to your target info.
- **Spotting:** Visually targeting an item to see through your device, then lining up the device lens to your eye to see detail.
- **Scanning:** Repeated fixations with your eye that let you see one item after another such as following words across a line of print.
- **Tracing:** Visually following a line in space to locate a target such as the line on a form to find the words at the right.
- **Tracking:** Visually following a moving object such as a bug.

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## Concepts of Effective Training for Device Use

- Familiar to unfamiliar
- Stationary objects to moving objects
- Large to small
- One plane to several (distance device)
- Private practice to public use

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## Special Education law & access to the general curriculum

- NC 1500-2.2: Assistive technology device means any item, piece of equipment, or product system... that is used to increase, maintain, or improve the functional capabilities of a child with a disability.
- NC1501-2.3: (a) Each public agency must ensure that assistive technology devices or assistive technology services, or both, are made available to a child with a disability if required as a part of the child's (1) Special education; (2) Related Services, or (3) Supplementary aids and services.

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## Examples of Devices

- Near Magnification:



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### Selecting the Right Magnifier for Different Tasks

- **Stand (e.g. dome):** inexpensive, variety of designs, portable, fixed focal distance, bulkier, user can write under some models
- **Handheld:** portable, inexpensive, cosmetically acceptable, focal distance must be held constant, one or both hands must be used to hold a focus
- **High plus glasses (Microscopes):** hands free, fuller field of view, variety of designs, more power-less distance, head and arm movements necessary for scanning, more expensive
- **Electronic (e.g., video mag):** very expensive, decreased perceptual span which slows down reading; more appropriate for spot viewing

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### Fixation: Looking at an object through a lens



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Localization:  
finding  
something  
amidst  
clutter

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### Focal Distance: Adjusting Magnifier Position



- Finding the right spot (E↔L↔M)
  - Adjust **eye** to **lens** (focal distance)
  - Adjust **lens** to **material**
- Keeping a stable position
  - Identify options for balancing hand
  - Be aware of tension in neck, shoulders, and arm

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### Scanning: repetitive fixations that are required to look from one target to another

- Maintain steady fixation
- Reduce clutter. Start with double spaced materials.
- Use a consistent pattern
  - Student must use reliable method for stabilizing material
  - Start with stand magnifier and move to hand-held
  - Keep it fun with games

c...a...n.....y....o...u....r....e.a...d...my.....note?

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Young student completing a scanning activity

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### Scanning as a Literacy Goal



Emergent literacy



Fluid scanning for continuous text reading



Conducting an informal reading assessment

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### Spot reading with a magnifier



- Use search pattern to select target area
- Note bold headings, sidebars
- Select spotting tasks with increased challenges (printed concert times, dates on food packaging)

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### Visual Tasks: the Grocery Store

#### TELESCOPE

- Reading
  - Aisle number & Food List
  - Prices on high shelf
  - Product Look-Up code (PLU#)
  - Register screen
  - Customer Service desk information
- Locating
  - Specific food
  - Car in parking lot

#### MAGNIFIER

- Reading
  - Price tags
  - Coupons/store ads
  - Weight, expiration date
  - Packaging information
  - Receipt
  - Magazine while waiting

- Visual Challenges:

  - Overhead fluorescent lighting
  - Carts and people
  - Difficult angles to spot info

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## Developing Stamina

- **Practice** makes better
- Student should have the opportunity to use the device with short, **daily** reading assignments which are monitored in some way (keep a chart of timed readings across grade levels)
- Continue to **record** progress
- Direct instruction in reading **fluency**

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## High plus glasses: Extended Reading

- Reinforce correct work distance
- Experiment with best reading method
- Allow time to adjust to new system
- Check lighting and body position
- Involve student in keeping a record of progress




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## Tracking: following a moving target



fingernail painting



handwriting



nature observations

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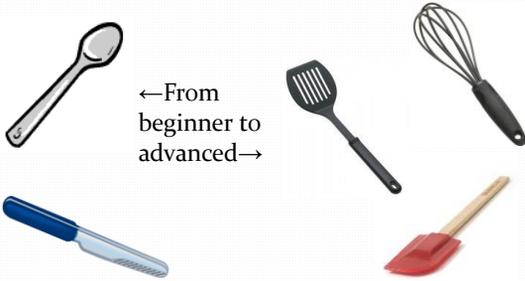
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### As my skill increases-so do my tools



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### Training with Telescopes



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### A Day in the Life. . .

- Identification of bus number, street name, building
- Business name or advertisement from bus window or sidewalk
- Overhead signs in stores, menus in restaurants
- Presentations in meetings (web info, Powerpoints)
- Spectator activity-theater or sports arena
- Television viewing for details (e.g. facial expressions or print information)

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## Terminology

- **Localizing:** Visually selecting an object from objects around it such as seeing a street sign against a row of trees.
- **Focusing:** Bringing an image into clearest view by adjusting the distance of the lens on your device to your target info.
- **Spotting:** Visually targeting an item to see through your device, then lining up the device lens with your eye to see detail.
- **Scanning:** Repeated fixations with your eye that let you see one item after another such as a row of cans on a store shelf.
- **Tracing:** Visually following a line in space to locate an object such as the edge of a sign to find the letters at the top.
- **Tracking:** Visually following a moving object such as a rolling ball.

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## Examples of Devices

- Telescopes



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## Bioptic Telescope

Preparation for driving

Preferred by some for hands-free classroom use



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## Clip-on/Flip-up Scopes



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## So higher power is better, right?

Not necessarily!

As power increases, field decreases.



As the print on the books gets bigger, you have fewer and fewer books in the frame.

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## Telescope: Challenges for the User

- Magnification of motion
  - Any shaking is amplified, image is blurred
  - Speed of moving object exaggerated
- Distortion of distance
  - Objects appear nearer and closer together than actual
  - Disorientation of spatial perception
- Field of view restricted
  - Tunnel effect, loss of peripheral information
  - Control of target fixation easily lost from view

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### Factors Contributing to Proficiency

- Tolerance of telescope restrictions
  - Getting beyond a negative first response
  - Practice builds comfort
  - Option not to use
- Perceptual skills of recognizing part to whole
  - Familiarity with magnified telescopic image
  - Build awareness with near activity practice
- Loss of control of distance environment
  - Confusion of background effect
  - Lighting issues
- Eye hand coordination

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### Awareness of Dominant Eye



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### Localizing: finding something amidst clutter



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### Positioning & Stabilizing Telescope



- Placement on face
- Finger grasp
- Eye alignment
- Viewing through objective lens
- Body stabilization (sitting & standing)

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### Localizing, then Spotting

**Locate** object first without the scope, then **spot** through scope to verify detail



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### Focusing: bringing an image into clearest view

- Demonstrate turning controls on projector, video magnifier or camera to change clarity
  - Set best focus and ask student to look (without telescope)
  - Turning controls, blur the image
  - Return to clear image by turning controls
- Transfer previous procedures to the telescope
- Ask student to move barrel of scope to make image blurry and clear

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### Focusing the Telescope



- Consider starting with a pre-focused device
- Orient student to mechanics of the device
- Practice “closing” and “opening” telescope
- Slowly turn past clear point to blur, then return

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### Adjusting Focus to Allow for a Variety of Planes- nearer/farther



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### Tracing: Visually following stationary lines

- Position student facing horizontal or vertical line
- Locate line without device
- Raise device so it is placed between eye and the line
- Move head, not eye, with a slow smooth movement while following the line
- After proficiency is obtained with perpendicular lines, move to lines that project away from student (requires changing focus while tracing)

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### Tracing



Trace (visually follow) the sidewalk to the intersection

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### Scanning to copy symbols, words, and sentences written on a board



Photo credit: Smartboard classroom technology Keller Elementary Franklin MA

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### Scanning: repetitive fixations that are required to look from one target to another



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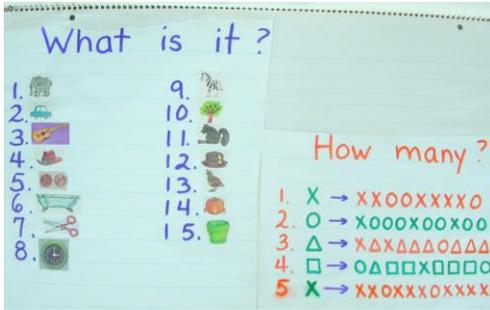
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### Sample of 2 scanning activities




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### Sample chart for scanning/copying

- Tie the wire around the top of the pinecone.
- Spread the peanut butter on the pinecone.
- Put the cone in the baggy and shake.
- Tie the cone on the tree.

Credit to Chrissy Cowan for scanning lesson materials

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### Tracking: visually following a moving target

- Start with targets that are stationary, but require moving the head/telescope to follow the target (e.g., print/pictures on a board)
- Next use targets that move slowly from left to right (someone walking across front of room or writing on white board)
- Instruct student to support the arm holding the telescope
- Take student into different environments to expand skill

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## Tracking-continued

- Continue with targets that move left to right (car on road; person walking; teacher writing)
- Slowly decrease target size; increase distance from target
- Have student follow the target using head movements only; keep telescope stable against eye
- Add targets that move in variable patterns (birds, animals, kids on playground)

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Tracking the blacksmith's demonstration

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## Visual Tasks: the Mall

### TELESCOPE

- Reading
  - Mall directory
  - Overhead menus
  - Movie times
- Locating
  - Concourse performers
  - Car in parking lot
  - Friends

### MAGNIFIER

- Reading
  - Mall directory
  - Sale circular, coupons
  - Clothing size, price, care
  - Instructions on game packaging

- Visual Challenges:

  - Glare from waxed floors, sky light
  - Heavy traffic in walkways
  - Difficult angles to spot info

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**Pulling it All Together:**  
Locating, focusing and tracking targets that move through more than one focal plane

- Examples include: paying attention to traffic, attending sports events, people watching in a crowd
- Combine all skills learned to move beyond school environments: field trips, stores, travel in new area
- Encourage student to keep a list or journal of places and events viewed with devices

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### Tracking in Real Life



Photo by lorenkerns

Following the action in a soccer game



Photo by Joanna D R

Following the action in a play

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### Telescope Olympics-Go for the Gold!

- Practice one-hand focusing
- Check speed and accuracy
  - Copying from the white board
  - Reading complex signs outdoors
- Look for mid-range tasks
  - Labels inside the prepared food case
  - Mall or office building directory




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### From Training to Integrated Use



Eyes on the World

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### Preschool: Optical devices for fun

- Kaleidoscope-curiosity, positioning, holding, describing
- Paper roll tube-locating, spotting, scanning
- Pre-focused telescope-choosing target, naming magnified image
- Stand magnifier to see picture/object details



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### Elementary: Optical devices for inclusion

- Maintaining correct work distance
- Accessing a variety of texts (maps, charts, equations, etc.)
- Increasing literacy skills (e.g. reading speeds)
- Participating fully in social settings



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## High School: Optical devices for independence

- Anticipating the need for optical devices
- Building speed & efficiency
- Generalizing skill use to community settings



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## Development of Optical Device Skill Leads to Visual Independence for All



This student uses a mounted telescope to watch a baseball game

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## Summary of Device Instruction

- Awareness of optical device **skills**
- Anticipation of **benefits** from device use
- Acceptance of **limitations**, difference of speed in access to information

**Skills + Benefits + Limitations = Device Use**

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## Training Resources

- Corn, A. & Erin, J. (2010). *Foundations of Low Vision: Clinical and functional perspectives*. 2<sup>nd</sup> edition. New York, NY. AFB Press.
- D'Andrea, F.M. & Farrenkopf, C. (2000). *Looking to Learn: Promoting literacy for students with low vision*. New York: AFB Press.
- Region 4 Education Service Center. (2004). *Program in Low Vision Therapy*. Houston, TX: Region 4 Education Solutions.
- Smith, A. (1992). *Beyond Arm's Reach: Enhancing Distance Vision*. Pennsylvania College of Optometry Press.
- Weiner, W. & Vopata, A. (1980). Suggested Curriculum for Distance Vision Training with Optical Aids. *Journal of Visual Impairment and Blindness*, February, 49-56.

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**Part 2: Outline of presentation**

- Psychosocial aspects of students with low vision
- Rationale and preparation for the clinical low vision evaluation
- IEP goals and objectives that incorporate use of optical devices for increased functioning
- Practice with taking and using meaningful data

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**Life-sized Eyeball**

*Texas SenseAbilities, Spring 2015*

A photograph of a group of about ten children in a classroom or activity room. They are all holding up their arms, some holding red balloons, as if participating in a game. The room has tables, chairs, and educational posters on the walls.

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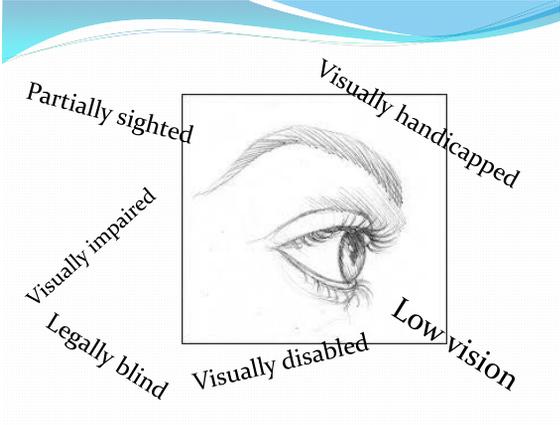
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### Where do I fit in?

- Somewhere between totally blind and fully sighted
- Mixed emotions, mixed messages depending on setting
- Pressure to keep up in the classroom, on the playground
- Assessment of my own abilities and competence
- Concern for my future goals, independence

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### What's my next lesson?

- Observe. *Observe. Observe.*
  - Take notes (e.g., measure distance to board, take pictures)
  - Prioritize needs through assessments (e.g., listening)
- Identify visual tasks throughout the student's day
  - Learning materials
  - Learning environments
- Teach the skills needed to access the curriculum
  - Using tools/devices; modifying print; advocating needs
  - Increasing the expectations, building independence
- Develop rapport with the student

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## Support for direct instruction

- Summary of student's visual info (LV eval, FVLMA)
- Importance of written notes, data to plan IEP goals
- Where are the gaps (deficit areas) for my student?
- Making a plan for direct instruction




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## Why is this eye doctor special?

- The entire visual system is considered (e.g., near acuity, contrast,)
- Emphasis on improved functioning across daily tasks
- Fine tuning of full-time wear glasses prescription (low vision challenge)
- Full range of glasses options and therapeutic lenses available (e.g., prisms, light occluding contact lenses, high plus Rx)
- Up-to-date advances in optical device manufacturing

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## Working towards collaboration

- Awareness of teacher, student, and doctor's goals
- Knowledge of low vision testing tools, purpose
- Specific examples of visual demands (school, home)
- Information to include in the low vision report
- Follow up contact preference (email, phone call)




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## Ownership as a device user

- Understanding eye condition and implications
- Including student in the decision process
- Considering age and high interest activities
- Being aware of appealing, more discrete devices
- Noting reactions from peers-direct or subtle
- Discussing pros and cons of device design, function

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## Preparing for the low vision exam

- Sharing information with parents, educational team AND student on purpose of LV specialist evaluation
- Developing student motivation to set goals and make the most of the exam
- Giving instruction time to learning about and preparing for the LV exam (see reference list)
- Exploring a range of devices ahead of time
- Writing down questions on eye condition, devices to consider

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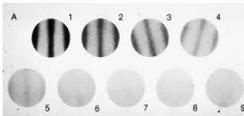
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## Measuring low vision




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“I’d like to ask some questions at the end of the exam. Will that be okay?”



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Investigation of reading with low vision



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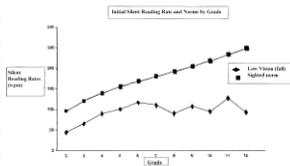
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Reading data on students in Tennessee



Corn, et al., 2002

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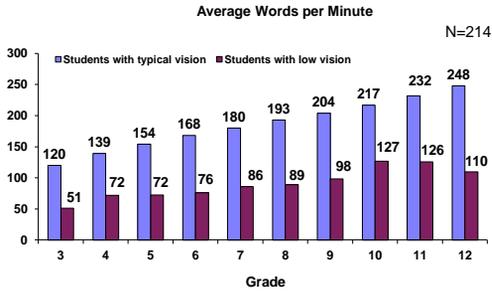
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## Reading Data on Texas Students




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## Reading Experiences of Students with Low Vision

- Finding the right place on the page
- Looking closely at a page
- Reading as fast as peers
- Tiring quickly or needing breaks
- Hearing comments about reading behaviors
- Using different materials or devices
- Being singled out as needing additional supports

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## Reading Experiences cont.

- Reading in a different way but accomplishing the assignment
- Knowing the text well because of slower reading
- Remembering features of a text that took more time to understand
- Making gains in comprehension because of dual input-audio and visual

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### Characteristics of Low Vision Readers

- Sacrificing accuracy for speed may be a result of the pressure to keep up the reading pace with peers; adopt a guessing strategy
- Tend to rely on context rather than phonological or spelling patterns; less effective as text difficulty increases. reduced context (e.g., math, science,)
- Reading lag (speed, comprehension, and accuracy) increases with each school year
- Young readers often accept poor reading conditions: 1. unable to evaluate reading needs; 2. want to be helpful and not be a problem

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### Perception of myself as a reader

- What kinds of things are interesting for you to read?
- What comes to mind when you need to read in class?
- What helps you to handle long reading assignments?
- What would you most like to change about how you read?
- How is reading different when you have low vision?
- What do you wish teachers would do differently when they work with students on reading?

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### Give me Evidence: Taking data

- Choose 1 station-pair with a partner
  - Taking a reading speed
  - Taking a copying speed
  - Taking a spotting speed for near
  - Taking a spotting speed for distance
- Bring comments back to the group
- Involve student in charting “skill check”

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For people without disabilities,  
technology makes things easier.  
For people with disabilities,  
technology makes things  
possible. IBM training manual 1991



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### Goal for Near Tasks

- Goal: Student will use assistive technology to access print materials in near tasks
- Objective 1: Student will increase reading rate by a minimum of 20 wpm using a handheld magnifier with continuous text (e.g., chapter book, textbook)
- Objective 2: Student will use a tablet app to read print of downloaded books with audio support and keep a reading record for the selected class
- Objective 3: Student will give rationale for selecting a specific tool to match near tasks in all subject areas

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### Goal for Distance Tasks

- Goal: Using assistive technology, student will follow along as board work takes place in the classroom:
- Objective 1: Using a monocular, student will copy up to 5 words per glance through the device in a minimum of 2 subject areas
- Objective 2: Student will use a tablet app connected with interactive whiteboard (e.g., Smartboard) in extended board instruction
- Objective 3: Student will give rationale for selecting a specific tool to match distance tasks in all subject areas

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## Device Goals for Practical Tasks

- Goal: Student will use assistive technology for spotting visual information in activities of daily living
- Objective 1: Student will use a dome magnifier to independently spot picture symbols of food ingredients and cooking directions for preparation of simple foods 3x/week in classroom lunch
- Objective 2: Student will use a monocular to independently find a minimum of 2 stoplight signals within 30 seconds and determine safe crossing on weekly grocery trips

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“We will have failed in our role if our success is mostly that our student has passed every class but struggles to manage daily tasks. We will succeed if our student can access visual information using their own set of skills and strategies to achieve goals.”

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65<sup>th</sup> CONFERENCE ON EXCEPTIONAL CHILDREN

**GRADUATION:**  
The Measure of Tomorrow

**Picture that 1 student  
in school today**

Case study, questions,  
take-home thoughts

PUBLIC SCHOOLS OF NORTH CAROLINA  
State Board of Education | Department of Public Instruction

November 18-20, 2015

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# Vision Ergonomics

The following are things to consider when optimizing a student's visual performance in classroom settings.

## Consider the Etiology

Familiarize yourself with the characteristics of the most predominant visual conditions resulting in low vision and their effects, such as retinitis pigmentosa, ocular albinism, retinopathy of prematurity, optic nerve hypoplasia, cortical visual impairment, cataracts, coloboma, nystagmus, central scotoma, glaucoma (this list is not complete). A current (4/2011) web resource for this is <http://www.svrc.vic.edu.au/AV.shtml> "Visual Impairment". Look for such things as:

## Effects of Light

Examples: cataracts cause light to be scattered over the retina meaning that bright light and glare will usually cause problems for the student, whereas the student with retinitis pigmentosa (RP) will require high illumination. Glare for some would be disastrous. Overhead lighting might be too low/high, depending on the etiology. Illuminated screens (any type of lighted display) would be difficult for some, necessary for others.

## Field Deficits

Examples: students with Stargardt's Disease can have a central acuity loss, making staying on a line of print difficult without specific training. Students with RP tend to lose the peripheral field, thus making enlargements difficult to scan.

## Eye Motor

Examples: students with nystagmus tend to have problems shifting gaze from one target to another (typical of copying assignments).

## Consider Posture

A computer work station that is poorly arranged in regards to lighting would reduce visual efficiency. Whereas marketed reading stands straighten the student's posture and elevate the reading material, students typically need to write on the same (slanted) surface. Look on occupational therapy websites, such as <http://www.therapro.com/>, for a writing stand that does not have the ridge at the bottom which makes writing uncomfortable. Or, use a 3 inch 3-ring binder turned sideways.

## Consider Organization

It takes the student with low vision longer to find things. Students need to access their materials quickly, so storing for quick retrieval is necessary. Consider a small, stick-on battery operated closet light that you press for inside desks and other darker spaces. Backpacks will need folders and other organizational containers to keep papers

organized, and smaller objects in desks should have dedicated containers. The TVI will need to check and reinforce that an established system is used consistently.

## Consider Lighting

### For Work Surfaces

With some eye conditions, a lamp might be necessary to put light precisely where it is needed. If an outlet is nearby, the APH lamp is wonderful. Another option is a battery powered OTT light that can be moved from room to room. When positioning the light, make sure the student's head or hand does not occlude the light, or that the light is shining on the student's face.

Students with albinism or cataracts might have difficulty with too much ambient light and/or glare, which can cause headaches and have a “wash-out” effect on certain materials. Tinted lenses might be beneficial for some, or a light blue filter placed over the reading surface could change the contrast (watch for glare off of shiny surfaces).

### Overhead Projector Screens and Smart Boards

When the target surface is lighted or bright, students with lighting issues may have difficulties. The classroom lighting can be adjusted to accommodate, or in extreme cases, the student may need to have a desk (print) copy if significant copy work is required.

## Consider Writing Tools and Materials

Provide adapted paper and writing tools, and adjust lighting and positioning of materials (see writing slant board above) if needed. Examples of writing tools include drafting pencils (or #1 soft lead, available in art/craft stores) and fine point felt tip pens. Student may perform better with bold line paper, or commercially available wide ruled notebook paper with darker lines (compare these at the grocery store—some are darker than others). Gradually move toward fewer adaptations as student becomes more proficient.

## Consider Optical Devices

Assuming student has been seen by a low vision specialist, start by making sure the prescribed optical devices are on hand and the student has learned how to use them correctly. Devices that tend to be handed to students by well-intentioned people should be avoided. (e.g., full page magnifier) Electronic near devices are best used for “spot” viewing, and will slow the student down when reading longer passages. If a closed circuit TV is in the room, find out if it is being used consistently. If it is not (perhaps due to portability, placement, too much enlargement) consider retraining student on a handheld or stand magnifier. There are now products available from APH and Education Service Center, Region 4 that are designed for teaching optical device use. Refer to *Looking to Learn: Promoting Literacy for Students with Low Vision*, D’Andrea and Farrenkopf, Eds., AFB Press.



# Texas School for the Blind and Visually Impaired

## Outreach Programs

[www.tsbvi.edu](http://www.tsbvi.edu) | 512-454-8631 | 1100 W. 45<sup>th</sup> St. | Austin, Texas 78756

## Tips for Increasing Your Student's Reading Fluency: For Students with Low Vision

Prepared by Chrissy Cowan, TSBVI Outreach

Several strategies can be used for building fluency. Two are featured on this tip sheet: **Paired Reading** and **Listening While Reading**. *If your student has a prescribed optical device, (s)he should be using it during these reading sessions.* You can use an interesting book or magazine on the student's reading level, or select short, interesting pieces (e.g., website page, report on new technology, current events article) that may capture young readers' attention such as humorous or suspenseful openings, descriptive passages, or bizarre facts.

### Definitions:

**Paired reading** is a simple but effective technique for helping struggling readers to increase their reading fluency and accuracy in text. The adult and student read together from the text. When the student chooses, he or she can read alone, while the adult follows along silently in the text. Whenever the student misreads a word or otherwise makes a reading error, the adult supplies the correct word and resumes reading aloud along with the student.

**Listening While Reading** is a simple but effective technique for helping struggling readers to increase their reading fluency and accuracy in text.

### Steps:

#### Paired Reading Steps:

1. Read from the page with your student
2. When your student taps your hand, let him read alone as you follow along silently
3. If the student reads a word wrong, skips a word, or doesn't know a word (wait 5-seconds):
  - Point to the word
  - Say the word
  - Have the student repeat the word

Prepared for Low Vision Tools and Strategies; Short-Term Programs

- Join the student in reading aloud again

**Listening While Reading Steps:**

1. Read aloud from the page for about 2 minutes while your student follows along silently.
2. Next, have your student read aloud alone from the same passage that you just read while you follow along silently.
3. If the student reads a word wrong, skips a word, or doesn't know a word:
  - Point to the word
  - Say the word
  - Have the student repeat the word
  - Tell the student to continue reading

Monitor fluency every 4 weeks during your training.

To **Monitor Fluency**, the student:

1. Independently reads unpracticed text to the teacher and graphs the words per minute (wpm) score on a Reading Record page
2. Practices rereading the same text several times
3. Independently reads the text again to the teacher
4. Graphs score in a different color



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### Top 10 Tips for Optical Device Use

Prepared by Cindy Bachofer

This page gives a quick summary of some ideas for helping your child improve skills with optical devices (magnifiers, telescopes, glasses.) A couple of the items that follow apply to all devices. Most of the items refer to either a near (magnifier, glasses) or a distance (telescope) device. A book titled *Looking to Learn* gives good ideas for activities at home and at school to build skills.

Optical devices are carefully designed tools that work best when matched to the specific needs and vision of your child. A low vision specialist, an eye doctor trained in low vision, should be consulted to recommend the best tools. This medical professional focuses on individual goals and functioning in everyday tasks.

The teacher of students with visual impairments (TVI) and/or the Orientation and Mobility specialist (O&M) who works with your child can give more information on topics such as techniques for focusing, outdoor use, or comfortable positions for device use. Your child may also have an IEP goal written on learning to use optical devices.

1. An optical device makes objects look larger so things are easier to see. This means that you can help your child focus the device. Your child may “re-set focus” slightly but you can help by checking that the view is not blurry. These devices are made of inexpensive materials (metal or plastic and a clear lens) but they need to be taken care of to last and work well.
2. Setting focus takes a little practice but quickly becomes second nature for the device user. Turn the middle section (the barrel) of the telescope to set focus. The “closed” or shortest position of the telescope is the best starting point. Turn the barrel slowly *while* looking through the scope. As the barrel becomes longer or is more “open,” the user is able to see things that are just beyond arm’s reach. Test this to see how it works.
3. Matching the tool your child uses to his or her level of vision is very important. The device your child receives is a specific power or strength, for example 3x for 3 times magnification. The ideal formula is having the widest field of view through the lens with *just enough* power for comfortable viewing. Too much power can be a problem and make using the tool frustrating.
4. An optical device is versatile but one tool is not able to do all tasks. The 4x or 6x telescope may work well in a classroom (15’ viewing distance.) In an outdoor setting, your child may need an 8x for reading signs across the street (40’ viewing distance).

5. Getting the telescope lens as close to the eye as possible is the big goal. Most scopes have a soft rubbery end that is the eye piece cup. It helps to block out glare and to direct eye gaze. Some users prefer to keep their glasses on while using the telescope and others prefer to take off their glasses so that they gain the widest field of view through the lens. This is a personal choice for each user.
6. Two styles of magnifiers are common—a stand type that stays flat on the page (e.g., a dome magnifier) and a handheld that is lifted off the page. A stand is built to always be in focus when it's flat on the page. This type is good for young students who are exploring the page. The best viewing position of a handheld magnifier has space between the page and the lens and the lens and the eye. This is the work distance. The magnifier is not working at its best if it is flat on the page or held against the user's eye.
7. Reading a page of print with a magnifier or reading glasses (sometimes called microscope lenses) takes practice, concentration, and stamina—like an athlete learning the skill of handling a ball. Fluent readers stay on a line of print and move to the next line smoothly. Some students use their finger or a line guide (a ruler-sized piece of paper) to mark the line. Once the eye and brain have practiced reading with a magnifier, the line guide is used less and less.
8. Learning to use a tool can be hard work. Sometimes, people stare when they see someone using a device and this can be awkward. Help your child develop skills with the device and feel good about using it by practicing at home or away from others. Start with high interest items such as finding a favorite cartoon character on the TV at a 10 ' distance with a telescope or reading the bright advertisements in a store's weekly ad with a magnifier.
9. Your child will build skill if adults help with practice and encourage regular use. Your child can use the telescope to read business signs or traffic signals when you are doing errands. Your child can read information on food packages to you during kitchen time while cooking or washing dishes. Look for times each week that you expect and need your child to use devices to find information for you.
10. An optical device is as important as house keys or a cell phone. This tool gives access to what is valuable and important. Each tool should have a carrying case when being used away from home and a specific place to be kept at home so the user always knows where it is when needed. Your child can show others (e.g. siblings, neighbors) how it works, but this tool is like an extension of his or her eyes. Being able to grab it quickly and knowing that it is ready to use are first steps to success with devices.

## Terminology for near devices

- Localizing: Visually selecting an object from objects around it such as seeing the brand logo to the left of words.
- Focusing: Bringing an image into clearest view by adjusting the distance of the lens on your device to your target info.
- Spotting: Visually targeting an item to see through your device, then lining up the device lens to your eye to see detail.
- Scanning: Repeated fixations with your eye that let you see one item after another such as following words across a line of print.
- Tracing: Visually following a line in space to locate a target such as the line on a form to find the words at the right.
- Tracking: Visually following a moving object such as a bug.

## Terminology for distance devices

- Localizing: Visually selecting an object from objects around it such as seeing a street sign against a row of trees.
- Focusing: Bringing an image into clearest view by adjusting the distance of the lens on your device to your target info.
- Spotting: Visually targeting an item to see through your device, then lining up the device lens with your eye to see detail.
- Scanning: Repeated fixations with your eye that let you see one item after another such as a row of cans on a store shelf.
- Tracing: Visually following a line in space to locate an object such as the edge of a sign to find the letters at the top.
- Tracking: Visually following a moving object such as a rolling ball.

Record of Reading Stamina

NAME \_\_\_\_\_

DATE	MATERIAL READ; DEVICE /FORMAT	TIME STARTED	TIME STOPPED	TOTAL TIME	# OF BREAKS	COMMENTS







## Record of Monocular Speed and Accuracy

Student: \_\_\_\_\_

Date	# of Words in Sample	# of Peeks Taken to Copy	Time (minutes)	Did you Check Your Work?	# of Words Correct on Final Draft





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## Tips for Using Your High-powered Reading Glasses

(also known as microscope glasses, base-in glasses, and high add glasses)

1. **Glasses for reading up close:** Your microscope glasses are a hands-free magnifier. This means your eyes will be close to what you are reading but your eyes can move faster than your hand when holding a magnifier. Devise your own system for propping the book up at a slant rather than leaving it flat on the table. This will help you to read up close for a longer period without tiring the muscles in your neck and shoulders.
2. **Best reading distance:** An important thing to remember is the correct reading distance—that means the amount of space between your eyes and the page—for seeing the words clearly. The doctor tested this in the office when you first tried the glasses. This reading distance may be different from how you read before. Build the habit of using the correct reading distance when you use your glasses. Based on your diagnosis, you may also notice that additional lighting is helpful because of the close reading distance. Try different desk lamps in your home or visit a business that sells lamps and make an in-store comparison.
3. **Best reading method:** This part is up to you. Try each of the three methods below and see which one you like best:
  - a. Moving your eyes across the line of print to read while keeping your head and the page still
  - b. Moving your head to read while keeping your eyes and the page still
  - c. Moving the page while keeping your head and eyes still.Give yourself time to try each method to find out which one is best for you.
4. **Time to adjust:** At the beginning, you may feel like the glasses do not help you very much or that your eyes are straining while reading. Give yourself (your eyes and brain) time to adjust to using them. You can time yourself and keep a **reading record** to find out

how you are doing with the new glasses. The next item explains how you can record reading changes on a chart.

5. **A record of your progress:** You can track your own reading time to find out how you are doing. The chart below is an example you can make on your own. These four steps give an easy way to keep track of your time.

- a. For the next 2 to 3 weeks, decide on a time each day when you can time yourself reading for about 3 to 5 minutes. Stick to the same amount of time every day. After school or after supper may be a good time. Use your glasses during the day for practice reading sessions (about 15 minutes for each session) before you time yourself.
- b. Choose a magazine you like or chapter in a book for your timed sessions. Read a different section from the same item when the timer is going. After the timer has gone off, count the number of lines or paragraphs you read. If you really like to count, you can keep track of the number of words you read!
- c. Use a timer so that your timed sessions are the same length each day. You can use the timer on your microwave or you may have a stopwatch in a timer or a cell phone at home. Push start when you begin and stop when you have reached the end of the time you set.
- d. Record how much you read (words or lines). Is it taking less time to read the same number of lines or paragraphs after 5 days, after 15 days? Are you able to read for longer periods? Practice sessions are **very** important. Time to start reading with your new glasses!

	Monday	Tuesday	Wednesday	Thursday	Friday	Satur day	Sun day
<b>Week 1</b>							
<b>Week 2</b>							
<b>Week 3</b>							

Prepared by Cindy Bachofer, PhD., CLVT

## Formula for Figuring Words per Minute (wpm)

Use this formula for figuring words per minute as baseline data when you will be working on increasing speed and/or stamina.

**Number of words read  $\div$  minutes**

Examples:

Jane read 253 words in 3 minutes.


$$253 \div 3 = 84.33 \text{ (round to 84)}$$

Jane reads 84 words per minute (wpm)

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Bob read 324 words in 5 minutes.

$$324 \div 5 = 64.8 \text{ (round to 65)}$$

Bob reads 65 wpm.

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Chad read 313 words the first 5 minutes, then 220 words the second 5 minutes.

$$313 \div 5 = 62.6 \text{ (63 wpm for the first 5 minutes)}$$

$$220 \div 5 = 44 \text{ (44 wpm for the second 5 minutes)}$$

You could say Chad reads 533 (313+220) words in 10 minutes, or 53 words per minute, and miss the fact that he declines in stamina as the length of the reading task increases.