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**Course 227 Classroom Accommodations for Students with Visual Issues (K-5)**
Learn how visual conditions affect classroom performance. Incorporate inexpensive and successful modifications to help your students succeed. Discuss specific accommodations for standardized and computer-based testing.

We've heard it time and again from ophthalmology, pediatricians and even some educators. "Vision has nothing to do with reading." Improving saccades and vergences are linked to improved reading fluency that not only shows immediate improvement, but also long term positive results as well.
– Dominick M. Maino, OD, MEd, FAAO, FCOVD-A

Vision at School: https://www.youtube.com/watch?v=VyWYlbhEKxA

Children with impaired vision have greater difficulty **learning**, **playing** sports, limited possibilities for **employment**, increased morbidity or mortality due to **accidents**, and difficulty with **psychosocial** development.
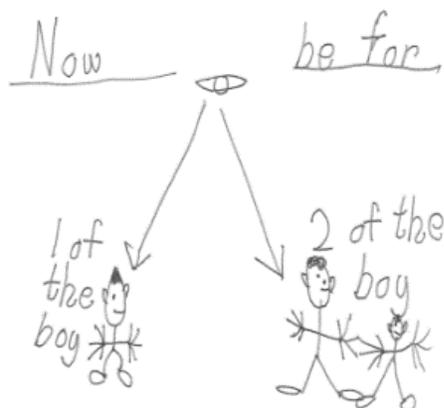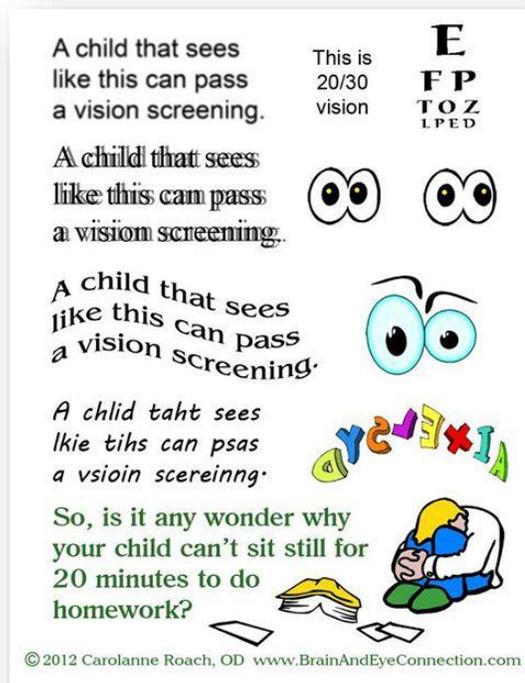
FOUR MOST COMMON VISION PROBLEMS:
1. Two-eyed (binocular) coordination
2. Focusing problems (blurred vision)
3. Eye movement and tracking problems
4. Amblyopia (lazy eye) and/or Strabismus (wandering eye)

WARNING Experiencing Reduced Vision - only participate if not sensitive.

Refractive Errors

Hyperopia: Farsightedness

- Additional effort is required to focus at near distances.
- The eye length is physically too short, or the focusing power is too little.
- Symptoms: headaches, eye strain, and/or fatigue. Squinting, eye rubbing, lack of interest in school, and difficulty in reading are often seen in children with hyperopia.

Myopia: Nearsightedness

- Vision is blurred at far distances, "near sight" is better.
- The eye length is physically too long, or the focusing power is too strong.
- Symptoms: squinting, headaches, and eye strain. Difficulties in reading the board are often seen in children with myopia.
- Typically ONLY testing completed at a school vision screening.

Astigmatism

- Inability to focus clearly at all distances.
- The eye curvature distorts the image.
- Symptoms: headache, eye strain, and/or fatigue. Eye rubbing, lack of interest in school, and difficulty in reading are often seen in children with astigmatism.

Visual Acquisition Skills

- Focusing (visual clarity)
- Following (tracking)
- Fusion (eye alignment)
- Visual Perceptual Skills
- Visual information processing: making sense of what we see.

1. Tracking Skills: Reading REQUIRES eye movements – smooth, accurate, voluntary movements (called SACCADES)
2. Copying requires near to far eye movements
3. Glasses do not make the eyes move any differently

Signs & Symptoms of an Eye Movement or Tracking Problem

- Losing place easily
- Difficulty copying from the board

- Head turns as reads across the page
- Skips words or lines unknowingly
- Rereads lines of print
- Binocularity

Two-eyed coordination (teaming) and focusing problems

- Necessary to see CLEARLY, SINGLY, and COMFORTABLY
- Require maintenance of alignment and focus
- Typically identified due to a decrease in reading efficiency, comfort and comprehension. (they tire, complain, rub their eyes, and lose their place)
- Problems most typically worsen as school demands increase: Smaller print, No pictures, More words per page

1. Binocular Vision Disorders
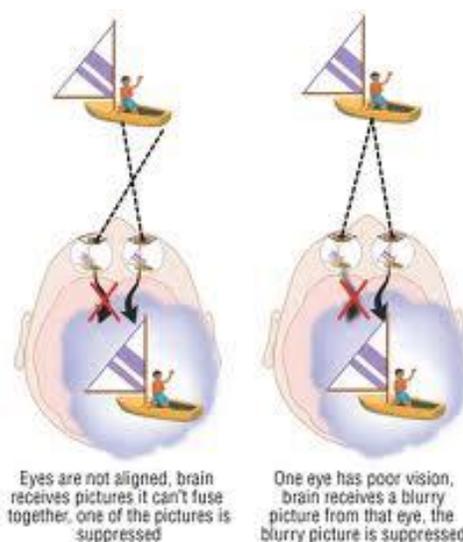   - Convergence Insufficiency
    - Convergence Excess
    - Divergence Insufficiency
    - Divergence Excess
2. Strabismus
    - Esotropia
    - Exotropia
    - Hypertropia
3. Deficient Stereopsis
4. Suppression

Eyes are not aligned, brain receives pictures it can't fuse together, one of the pictures is suppressed

One eye has poor vision, brain receives a blurry picture from that eye, the blurry picture is suppressed

Visual Perception

The panq was going to blay in the qark. Bodqy's father blayep the prum in the qanb. When the danb started to dlay, it pibn't sounp goop. The qrum was off the deat. The danp stoqbed dlaying. Then Bopdy's father lookep bown detween the qrums. There was Bodqy with a dig sqoon helding his father dlay the prums!

Count every "F" in the following text:
FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITH THE EXPERIENCE OF YEARS...

Amblyopia "lazy eye"

Strabismus "wandering eye" - Strabismus is a severe problem of two-eyed coordination in which the two eyes do not line up. They point in different directions and do not work together normally at least part of the time.

> *Options: 1. Ignore one eye (close it shut, cover with hair or hand, turn head to block with nose) –or- 2. Strain to keep single vision*

Most people consider surgery as the only option due to a "WEAK EYE MUSCLE"

Some cases are due to muscle/nerve palsies or mechanical restrictions

In MOST cases the actual cause is faulty neural control over the eye muscles.

Many patients with strabismus can develop complete alignment and eye teaming with therapy alone (surgery is not required to straighten their eyes).

The ABCs of Vision Difficulties

Appearance

Closing of an eye	Squinting
Eye turning in or out at any time	Tearing
Excessive blinking	Redness/Swelling

Behavior

Poor attention span	Poor eye teaming
Poor tracking	Confusion of shapes
Poor eye-hand coordination	

Complaints

Eye discomfort	Double vision
Headaches	Dizziness
Burning	Blur
Itching	

Modifications to help your students succeed

Classroom placement

- Move the student closer to the teacher
  - Watch for: Squinting, Standing, Leaning forward in the chair, tilting the chin up or down, and Glasses wear (they may not be a current prescription!)

- Place this student in an area with natural lighting. (LIGHT SENSITIVITY)
  - Wearing sunglasses or hats indoors, Athletes who have had a concussion, Kids with a history of car accident or trauma, Kids on medication, Place hand above eyes to shield them from fluorescent lighting.
- Seat them so that they do not miss the information on the poor vision side
  - Watch for Atropine Eye drops, Eye Patching
- Move the student closer to the chalkboard
  - Replace with material to be copied on his/her desk.
  - Provide an outline for note taking
  - Teach common abbreviations for note taking
- Reduce conflicting peripheral stimuli
  - Move the student to the front of the class, as close to the instructor as possible.
  - Make an "office" screen
  - Organize the classroom with bins and totes to block clutter
  - Limit the amount of visuals (bulletin boards, information on whiteboards/chalkboards)
  - Wear a baseball cap
- Large Print guidelines: increase font to 14 to 18pt print in order to reduce visual stress.
  - Enlarge on copier
  - Magnification sheet
  - Increase font size on computer
  - Zoom text
  - Increase font size on e-reader
  - Magnify print
  - Reading glasses
- Learning materials are well-spaced and well-organized on the page.
  - Cut page apart
  - Organize page into columns instead of full width
  - Use font, color, text boxes etc. to highlight important information
  - Use lists and bulleted points instead of narrative text
  - Add graphics
  - Learning materials are well-spaced and well-organized on the page.
  - Block with a window reader
  Http: //readingwindow.org/home/chapter-5-making-reading-windows/
  - Put on graph paper or add guidelines
  http://www.printfreegraphpaper.com/

- o Place math problems on lined paper with vertical orientation
  http://www.activityvillage.co.uk/printable-lined-paper
  - o Put on lined paper with vertical orientation
  - o Chunk assignments into smaller parts. (For example, less math problems on each page.)
- Allow for visual breaks during sustained near point work.
  - o Look up and away
  - o 20/20/20 Rule: every 20 minutes, look 20 feet away for 20 seconds
- Eye stretches and Ocular muscle pressure points

Viewing the Computer

Some important factors in preventing or reducing the symptoms of CVS (Computer Vision Syndrome) have to do with the computer and how it is used.

Location of computer screen - Most people find it more comfortable to view a computer when the eyes are looking downward. Optimally, the computer screen should be 15 to 20 degrees below eye level (about 4 or 5 inches) as measured from the center of the screen and 20 to 28 inches from the eyes.

Reference materials - These materials should be located above the keyboard and below the monitor. If this is not possible, a document holder can be used beside the monitor. The goal is to position the documents so you do not need to move your head to look from the document to the screen.

Lighting - Position the computer screen to avoid glare, particularly from overhead lighting or windows. Use blinds or drapes on windows and replace the light bulbs in desk lamps with bulbs of lower wattage.
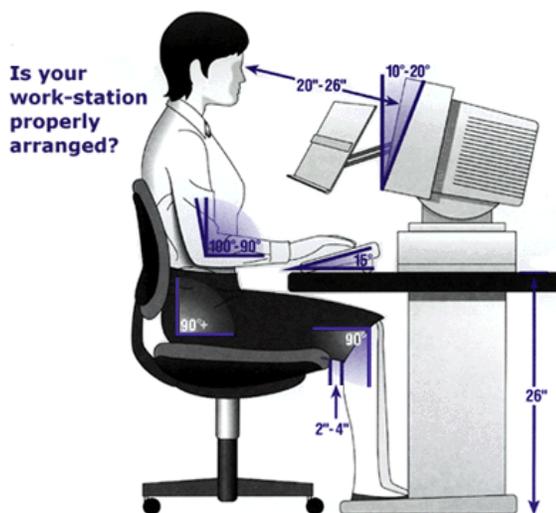
Anti-glare screens - If there is no way to minimize glare from light sources, consider using a screen glare filter. These filters decrease the amount of light reflected from the screen.

Seating position - Chairs should be comfortably padded and conform to the body. Chair height should be adjusted so your feet rest flat on the floor. If your chair has arms, they should be adjusted to provide arm support while you are typing. Your wrists shouldn't rest on the keyboard when typing.

Rest breaks - To prevent eyestrain, try to rest your eyes when using the computer for long periods. Rest your eyes for 15 minutes after two hours of continuous computer use. Also, for every 20 minutes of computer viewing, look into the distance for 20 seconds to allow your eyes a chance to refocus.

Blinking - To minimize your chances of developing dry eye when using a computer, make an effort to blink frequently. Blinking keeps the front surface of your eye moist.

- Provide "fat" pencils, felt-tipped markers and crayons
- Bold lined paper
- Wide rule paper
- Colored guideline paper
- Raised line paper
- Good contrast colors
- Encourage use of a pencil grip.
- Encourage proper paper placement and posture for writing.

1. RATE of producing written work
2. VOLUME of work to be produced
3. COMPLEXITY of the writing task
4. TOOLS used to write
5. FORMAT of the writing assignment

Writing Speed (RATE)

- Allow more time for note-taking, copying, tests etc.
- Allow student to begin projects or assignments early.
- Include time in the student's schedule to complete work during the school day.
- Keyboarding

Amount of work (VOLUME)

- Give outline of notes with headings, have the student fill in the details for note-taking.
- Dictate work to a scribe.
- Do not penalize score for neatness, spelling (or both) as grading criteria.
- Teach abbreviations.
- Provide a worksheet with problems already on it instead of having the student copy the problems.
- Allow answers in phrases and pictures.
- Shorten the length requirements.

- Simplify the assignment (Complexity)
- Have samples for student (cursive and printed letters).
- Include a laminated template of the format for the assignment. Make a cut-out where the name, date, and title belong. Use as a template for the assignment.
- Break assignment into stages.
- Allow editing marks instead of requiring a recopied product.
- Speaking spellcheckers or proofreading.
- Group projects.

Writing accommodations (TOOLS)

- Use paper with raised lines
- Try other line width papers
- Graph paper for math, or turn lined paper sideways to line up columns of numbers
- Mechanical pencils
- Various pencil grips
- Keyboarding
- Speech recognition software

Alternatives (FORMAT)

- Oral reports ---   Visual projects
- Aids to Visual Learning
- Visual Ergonomics
- Furnish a slanted reading and writing surface. Slant boards: Reading materials should be tilted twenty degrees off the table
- Foot stool
- Computer screen position
- All near vision tasks should be performed at an appropriate distance, the ideal being the length of the individual's forearm called Harmon's Distance (elbow to middle knuckle of fisted hand).
- Make use of natural lighting and full spectrum bulbs.
- Task lighting
- Contrast filters/Irlen filters
- Reading guides
- Provide highlighter markers to help with reading.
- Bookmarks
- Reading guide

- Paper blocking
- Spreadsheets*
- Allow the use of a finger in following along the line of print when reading. A marker assists, but direct tactual finger contact with movement will offer greater support and helps with integration
- Allow students to choose whether or not they want to read aloud.

Adequate time to complete assignments (slow visual tracking or processing speed):

- Make more time available on timed tests.
- Minimize the amount of homework
- Short visual work periods will tend to reduce stress and related fidgeting or fatigue.
- Allow for kinesthetic and multi-sensory learning.

Tasks requiring fine-motor and paper and pencil responses should be restructured to allow more gross-motor involvement, for example, copying similar but larger patterns.

- Allow for kinesthetic and multi-sensory learning.
- Encourage student to verbalize letters of spelling words while finger tracing them on a hard surface. Then "spell" the same words in the air with a finger to encourage visualization and visual memory
- Allow students to give test answers another way: pointing, speaking, drawing, touching

Examples of accommodations available for testing:

Presentation

- ☐ Large print (14 pt., 20 pt.)
- ☐ Reader (Note: Reader reads entire test)
- ☐ Fewer items on each page
- ☐ Colored paper
- ☐ Use of a highlighter
- ☐ Sign/orally present instructions
- ☐ Visual magnification (magnifier or magnifying machine)
- ☐ Auditory amplification
- ☐ Audiocassette
- ☐ Colored overlays
- ☐ Plastic covered pages of the test booklet

Responding

- ☐ Verbal; dictated to scribe
- ☐ Tape recorder
- ☐ Computer without spell check/grammar/cut & paste features
- ☐ Record answers in test booklet
- ☐ Large block answer sheet

Timing/scheduling
- ☐ Frequent breaks
- ☐ Extended time

- ☐ Multiple day (may or may not include extra time)
- ☐ Specified time of day

Setting
- ☐ Small group setting
- ☐ Private room
- ☐ Screens to block out distractions
- ☐ Special lighting
- ☐ Special acoustics
- ☐ Adaptive/special furniture/tools
- ☐ Alternative test site (with proctor present)
- ☐ Preferential seating
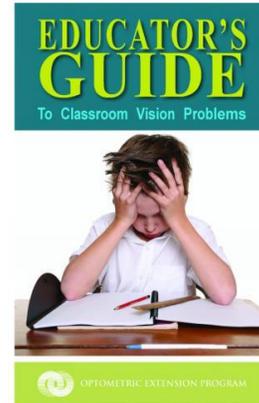
Resources: Optometric Extension program foundation: oepf.org

What would you do if you had a Vision Problem?

1. AVOID
2. ADAPT (auditory learning, hold book closer, move head to read, close an eye, tilt head)
3. COMPENSATE
4. REMEDIATE: Eye Surgery – Lenses – Prisms - Vision Therapy

Vision Therapy is that part of optometric care devoted to developing, improving, and enhancing people's visual performance.

Vision therapy involves medically supervised programs of therapeutic procedures and the use of medically regulated devices, such as lenses and prisms.

Vision and Learning
- ▸ An inefficient visual system may <u>contribute</u> to inattention, reduced classroom performance, and learning problems.
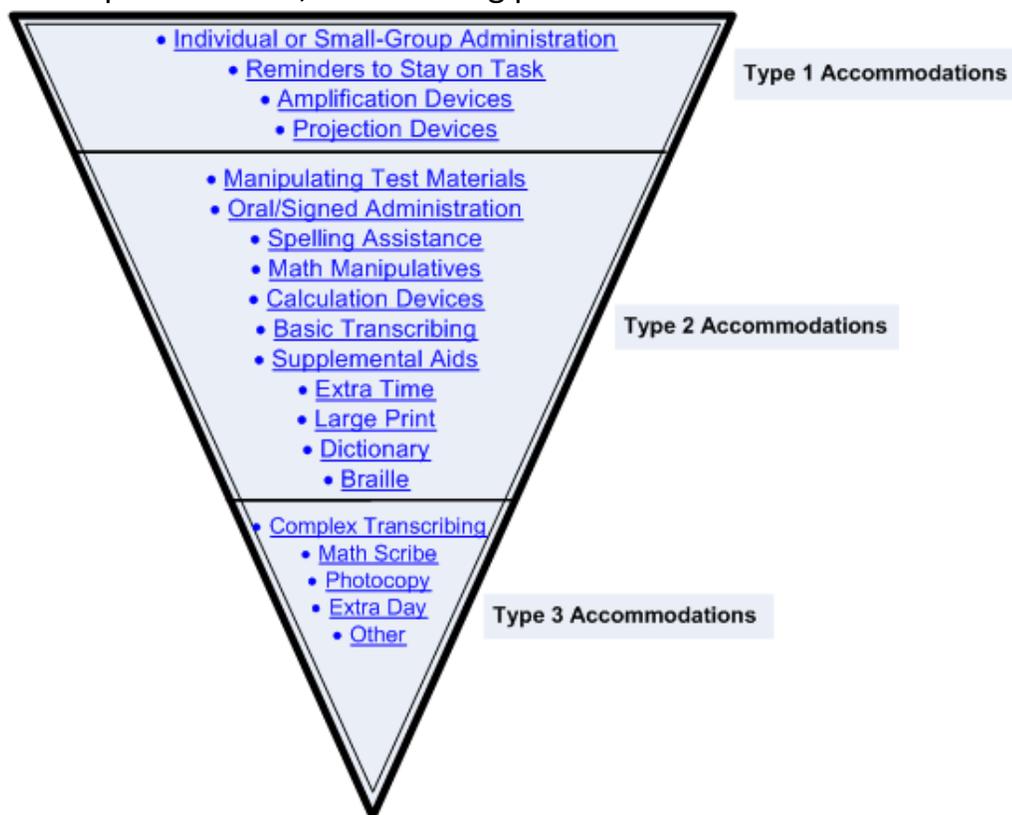
Bibliography
1. Leong D, Master C, Messner L, Pang Y, Smith C, Starling A. The effect of saccadic training on early reading fluency. Clin Pediat 2014;pages 1-7 (May 1, 2014, doi:10.1177/0009922814532520 http://www.ncbi.nlm.nih.gov/pubmed/24790022
2. Vision, Learning and Dyslexia http://www.aoa.org/optometrists/education-and-training/clinical-care/vision-learning-and-dyslexia?sso=y
3. AOA Clinical Practice Guidelines http://www.aoa.org/optometrists/education-and-training/clinical-care/vision-learning-and-dyslexia?sso=y
4. COVD summary of research in vision and learning http://c.ymcdn.com/sites/www.covd.org/resource/resmgr/Research/10a_Summar yofResearchonVisio.pdf
5. Association between reading speed, cycloplegic refractive error, and oculomotor function in reading disabled children versus controls.
 http://www.ncbi.nlm.nih.gov/pubmed/?term=quaid%2C+vision%2C+learning