

# Visual Impediments to Learning and Development

## Notes and Checklist for Symptoms and Signs of Visual Dysfunction

### Introduction

Visual Impediments to Learning and Development (VILD) are the most common undetected cause of apparent learning and reading difficulties. VILD can affect children who are apparently good learners, and cause them to struggle needlessly and even report a variety of medical concerns such as headache, blurry vision, double vision, sore muscles, and fatigue. If vision problems are not detected and properly managed, the child will not be able to reach their potential. For children suspected of reading and learning problems, including problems of attention, hyperactivity, and emotional stress, addressing vision first is the only means of achieving meaningful therapeutic ends through more traditional methods of remediation.

Vision is complex, and standard checks of 'eyesight' using eye charts are virtually of no use in detecting the most significant problems that interfere with child learning, development, and behavior. This information sheet provides a brief summary of the elements of vision and how these might impact on learning in the classroom. There is also a checklist to try to determine whether a child is likely to be struggling against 'invisible' vision troubles. These are invisible because they are most often not detected through psychological or medical assessments, and will not be reported by the student.

Of great importance is the fact that in EVERY school classroom there are many children who are certain to be struggling silently with vision problems, and this is even more of a problem among some isolated populations and ethnicities. Early assessment of vision and management of VILD is critical in avoiding unnecessary testing and in accelerating reading and learning therapies.

### What is Vision?

1. Eyesight (visual acuity as measured by eye charts) tells you as much about your vision as your strength or height tells you about your ability to run a marathon. Important, but only scratching the surface.
2. Vision is an ongoing physiological process that integrates input from the eyes, complex muscle systems, various cognitive elements, hearing, balance, and body sense (proprioception, touch).
  - a. Vision is related neurologically to 3/4 of the brain's functions and connections.
  - b. 80% or more of what is done in the classroom relies on effortless, responsive, and accurate Visual Signal Acquisition skills. (That part of vision that allows us to physically find and fixate upon targets.)
  - c. Classrooms are especially visually intensive.
    - i. Increasing reliance upon text-based 'instruction' and reading.
    - ii. Over-reliance upon near work, especially computers.

- d. There is currently no meaningful allowance for differences in visual skills in the classroom, yet it is the most important sensory element for neo-traditional learning – most important partly because of how we teach, but also because it integrates key senses at a very low level.
  - i. Vision operates at a very low level, like the basic input/output systems in a computer. Before anything complex can work, like advanced software, vision must be secured (healthy) and strong (reliable with no errors).
  - ii. Likewise, children must not be impeded by functional concerns at such a low level if they are to succeed to their full potential. Low-level errors in data acquisition lead to later concerns with information processing.

### 3. Physical Elements of Vision –‘Hardware’ (Visual Signal Acquisition, VSA)

- a. Alignment (aka posture). Potential problems include double vision, excess straining, decreased depth perception.
  - i. Strabismus (vertical, horizontal, small angle)
  - ii. Alternating Strabismus and Divergence Excess
  - iii. Convergence Insufficiency
  - iv. High lateral heterophoria, esophoria, vertical heterophoria.
- b. Focus (Accommodation). Potential problems lead to blurred vision, headaches.
  - i. Accommodative Insufficiency
  - ii. Accommodative Infacility
- c. Eyesight
  - i. Myopia (nearsightedness) – blurry far away, easy up close.
  - ii. Hyperopia (farsightedness) – some strain to see far away, greater strain up close and greater blur. Often a greater problem in the classroom than myopia, causes excess strain during reading and use of computers.
  - iii. Astigmatism (most often a problem) – distortion of images and add additional strain to viewing. Worse with detailed targets at near distance, such as reading and computer work.
  - iv. Anisometropia/Aniseikonia – mismatch in image sizes left vs. right due to large differences in prescription. Causes excess strain. Worse during near detailed work.
  - v. Amblyopia (‘Lazy/Bad’ Eye) – difficult processing detailed images, decreased depth perception.
- d. Saccades
  - i. Gross Saccades: Not often a major demand in standard classrooms, but functional assessment can reveal underlying developmental concerns.
  - ii. Fine Saccades: Assessment can illustrate specific deficits in oculomotor skills for reading.
  - iii. ‘Tracking’ – Similar to the above. Difficult tracking skills translate to poor reading, and these, as all visual skills, can be trained.
- e. Pursuits

- i. Not often a problem given students are not often required to engage smooth pursuits, but a good indicator of neuro-developmental status.
  - f. Spatial Awareness Inputs from Retina
    - i. Central Vision (macula)
    - ii. Peripheral Vision (outside of macula)
    - iii. The ability to move easily from central to peripheral awareness and to balance these two are critical in reading/writing and in classroom participation. This ability is in vision, but also audition, and physical (body) awareness.
  - g. Other Input Elements:
    - i. Balance/Vestibular Function
    - ii. Hearing/Audition
    - iii. Somatosensation/Proprioception/Kinesthesia
- 4. **Cognitive Elements of Vision** – ‘Software’ (Visual Signal Processing, or VSP aka VIP (Visual Information Processing))
  - a. VSP/VIP Elements (According to the Test of Visual Perceptual Skills (TVPS)-III, as one example.)
    - i. Visual Discrimination – identifying specific traits.
    - ii. Visual Memory – memorizing complex shapes.
    - iii. Spatial Relationships – relationships between objects in 2D space.
    - iv. Form Constancy – recognition of forms in different contexts and in different sizes.
    - v. Sequential Memory – memorizing sequences of figures.
    - vi. Figure-Ground Discrimination – distinguishing between signal and noise, use of specific vs. global awareness.
    - vii. Visual Closure – how much visual information is required in order to identify an object.
  - b. Central vs. Peripheral Spatial Awareness (included in both VSA and VSP)
    - i. From cortical and subcortical structures.
    - ii. Works with input from retina as well as balance and hearing.
    - iii. Necessary in guiding eye movements, especially rapid, automated saccadic movements.
    - iv. Affects span of recognition (the reading ‘quantum’)
  - c. Visualization – The ability to use visual imagery and constructs in order to problem solve, anticipate, and plan.

## Visual Impediment to Learning and Development (VILD) Sign/Symptom Checklist

If you suspect a child of having a reading or learning problem, this checklist can help to determine if there are significant Visual Impediments to Learning and Development (VILD). The scale is weighted so that some elements are more indicative of VILD than others.

**Instructions:** Put a mark beside the signs/symptoms that you have noted as observed by you or as reported by the child. Add the total score and use the scale below the list to determine relative risk. NOTE: Any child suspected of reading and/or learning difficulties should be referred to developmental vision assessment.

- Skip words while reading or copying (3)
- Loses place while reading or copying (3)
- Skip lines while reading or copying (3)
- Substitute words while reading or copying (3)
- Reread words or lines (3)
- Reverse letters, numbers or words (3)
- Use a finger or marker to keep place while reading and/or writing (3)
- Read very slowly (3)
- Poor reading comprehension (unless read to) (3)
- Difficulty remembering what has been read (3)
- Holds head too close when reading and/or writing (3)
- Squint, close, or cover one eye while reading (3)
- Unusual posture/head tilt when reading and/or writing (3)
- Headaches, generally (2)
- Headaches, especially following intense reading/computer work (3)
- Eyes hurt or feel tired after close work (3)
- Feel unusually tired after completing a visual task (3)
- Double vision (3)
- Eyesight blurs at distance when looking up from near work (3)
- Print seems to move or go in and out of focus (3)
- Letters and/or lines “run together” or words “jump” when reading (3)
- Crooked and/or poorly spaced handwriting (2)
- Misalign letters and/or numbers (2)
- Make errors when copying (2)
- Poor spelling skills (2)
- Difficulty tracking moving objects (2)
- Poor concentration abilities (2)
- Clumsiness (2)
- Difficulty with sports requiring good eye-hand coordination (2)
- Feel sleepy when reading (2)
- Dislike tasks requiring sustained concentration (2)
- Avoid near tasks such as reading (2)
- Intolerance to reading (2)
- Confuse right and left directions (2)
- Restlessness when working at a desk (2)
- Lose awareness of surroundings when concentrating (2)
- Must “feel” things to see them (2)
- Motion and/or car sickness (1)
- Unusual blinking (1)
- Unusual eye rubbing (1)
- Dry eyes (1)
- Watery eyes (1)
- Red eyes (1)
- Light sensitivity (1)

### Scoring criteria:

10-15 points = Possible functional vision problems

16-24 points = Probable functional vision problems

Over 25 points = Very likely functional vision problems

Please feel free to share this checklist. For more information visit [VisionMechanic.net](http://VisionMechanic.net)