

# LEA VISION TEST SYSTEM for Assessment and Screening

Playing Cards  
#252500



Single Symbol Book  
#250700



Single Presentation Cards  
#252700



Crowded Symbol book  
#250700



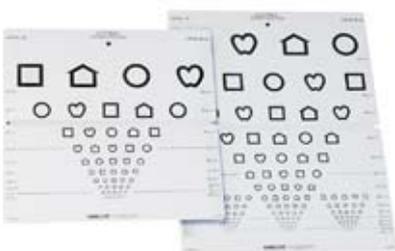
Screening near and distance test  
#252000 and #259900



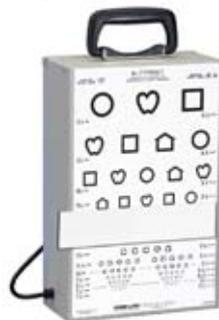
Standard near vision test  
#250800



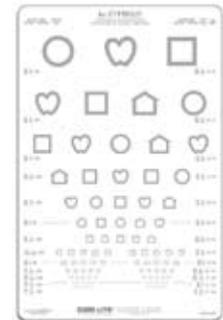
Folding VA charts #250200  
and #250100



Translucent chart for  
lightbox #252400



Low contrast charts for lightbox  
#253700--254100 (1.2% --25%)



LEA Gratings  
#253300



LEA Grating Acuity test  
#253100



Lea Symbols Low Contrast  
Screener # 251100



The International Classification of Functioning, Disability, and Health (ICF 2001, ICF-CY 2007) is the basis for assessing functioning and disabilities and requires consideration of all impairments and disabilities. The ICD-based measurement of visual acuity and visual field is adequate for reporting visual impairments in surveys, where visual acuities are reported for both distance and near vision (WHO/PBL/03.91; [http://whqlibdoc.who.int/hq/2003/WHO\\_PBL\\_03.91.pdf](http://whqlibdoc.who.int/hq/2003/WHO_PBL_03.91.pdf)).

Visual acuity tests are the tests most frequently used to assess visual functioning. These tests are designed so that geometric progression is the same at all visual acuity levels and spacing is proportional; i.e., on each line it is equal to the width of the optotypes on the line. Only a limited number of tests have the required structure. They include tests based on Sloan letters like the ETDRS test (Ferris et al 1982), on British letters (Bailey and Lovie 1976, Salt et al 2007), and on LEA Symbols and LEA Numbers (Vaidhyan et al 2007). These tests have been calibrated against the reference optotype, the Landolt Ring, and provide similar visual acuity values. The small differences found in visual acuity values in several studies depend on the structure of the cohorts. Some studies included extrafoveal measurements, which affect the values specifically for each set of optotypes (Hess RF et al 1978). In an ideal test, the optotypes blur equally at threshold (LEA tests). If differences exist with optotype recognition, optotypes are selected to include a certain number of easy and difficult optotypes on each line (Sloan letters).

### Visual Acuity

The LEA tests require recognition of optotypes. This requirement differs from resolving the direction of lines in the E-test or the gap in the C-test. In the assessment of visual acuity the goal is to measure the ability to recognise pictures of common objects, as well as characters and numbers.

Children's visual functions and communication during the assessment vary. Therefore, several tests have been designed to assess visual acuity in difficult test situations. Visual acuity tests include:

- Tests with single symbols for measurement at distance and near
- Line tests for measurement at distance and near
- Tests with tightly spaced optotypes
- Tests at low contrast: 25%, 10%, 5%, 2.5% and 1.2%.

Near and distance tests based on the same optotypes reveal differences in visual acuity between distance and near vision and are, thus, an improvement compared with the present situation in many countries where near vision is measured with text tests only.

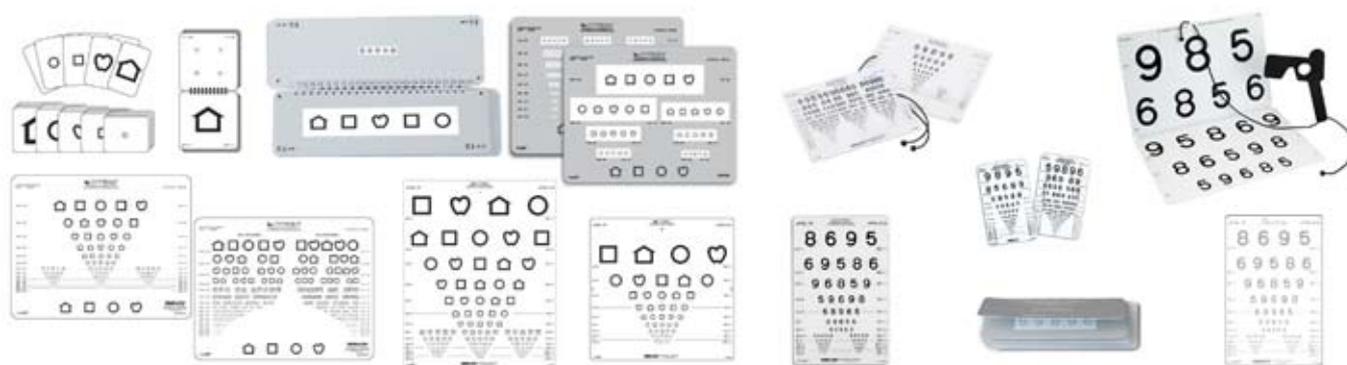


Figure 1. LEA Symbols visual acuity tests are single optotype tests, standard line tests, and line tests with tightly grouped optotypes. Single symbol tests for near (40cm) and distance (3m) are the easiest optotype tests because there is no interference by surrounding visual information. LEA Numbers visual acuity tests are fewer in number than the symbol tests because there are less often difficulties in communication in the assessment of school children and adults. The visual acuity line tests have 100% spacing between optotypes. Near tests include spacing of 50%, 25% and 12% to assess vision for reading and detect difficulties with other crowded information.

To achieve accuracy in measuring visual acuity, the tester should not point to individual optotypes. Pointing gives a visual reference, which improves fixation and visual acuity. Pointing to individual optotypes is likely to reduce

amblyopia detection. The tester can cover the line above the line to be read to ensure that the tester and the child are reading the same line.



If a child's oculomotor functions are irregular, the screening tests with more space between the lines in the near test and only one line visible on each page in the distance test facilitate testing. If fixation is stable but the saccades are irregular, the LEA Puzzle can be used as the key card, which will allow the child to feel the optotype forms without having to look at them. Many young children need a training period with the LEA Puzzle to learn matching or naming. While the child is playing with the LEA

Puzzle, the tester may observe the child's eye-hand coordination and visual and motor spatial memory by turning the puzzle board without the child noticing. The detailed instructions for testing are on the homepage [www.lea-test.fi](http://www.lea-test.fi).



### **Grating Acuity**

Grating acuity is measured either as *detection acuity* with LEA Gratings in a preferential looking situation or as *discrimination acuity* using LEA Grating Acuity Test, which requires the ability to define and show or describe the orientation of the lines.

### **Contrast Sensitivity**

Contrast sensitivity is measured with optotype and grating tests. If the results from the measurements of contrast sensitivity, visual acuity value, and grating acuity value are marked on the recording form, the type of visual information transfer at different contrast levels is clearly depicted.

### **Colour Vision**

"Color Vision Testing Made Easy", created by Terrace Waggoner, OD, works well in testing young children's colour vision. Quantitative measurements are possible with the Panel 16 colour vision test. The test can be trained at [www.lea-test.fi](http://www.lea-test.fi) Section Games.

### **Motion perception**

Detection and discrimination of slow movement can be tested with the Pepi test, which can be copied from [www.lea-test.fi](http://www.lea-test.fi). This test can be used to assess the vision of infants by observing the following movements. Older children can describe whether or what they see. Johansson's "Walking Man" can be used to test perception of biological movements.



### **Visual Adaptation**

Visual adaptation changes early in many retinal disorders. The functionally important cone adaptation can be observed during the CONE Adaptation test game. This test requires a room where the illumination can be changed quickly from photopic to mesopic luminance to measure cone adaptation time.

### **Direction and Length of Lines**

These two basic structures of pictures may be falsely encoded when entering the brain or distorted in the higher visual functions. They can be tested using the LEA Mailbox and LEA Rectangles.

### **Heidi Expressions**

Children may have specific loss of perception of facial expressions. To discuss facial expressions with young children, the Heidi Expressions cards can be used as a matching game.

If you have not used the tests before, practice with normally sighted infants and children with age appropriate behaviour. When you feel comfortable holding the tests and can concentrate on observing the child's way of answering, you are ready to test children with disabilities.

LEA Numbers chart for lightbox #271200



LEA Numbers Near Vision Card #270900



Low Vision Chart #272100



Low Contrast LEA Numbers Screener #270400



Low contrast LEA Numbers #271500--271900 1.2%--25%



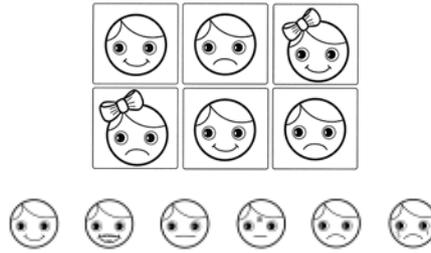
LEA Numbers Pocket Card #271000



Hiding Heidi Low Contrast Test #253500



Heidi Expressions Test #254500



Fixation Stick and Paddle #253000 and #253100



Panel 16 Colour vision test #260122



Cone Adaptation Test #252900



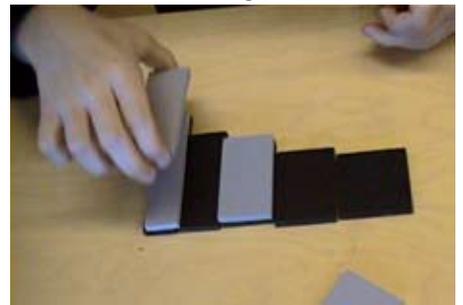
LEA Mailbox #254700



Visual field test, wand with and without flicker #800500



LEA Rectangles #254600



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