



LEA Symbols & LEA Numbers Near Vision Card with 16" (40 cm) Measuring Cord (251000)

Near vision is functionally more important than distance vision in the life of a young child. The child is also more accustomed in using vision at near than at greater distances. Therefore introduction of the test situation at near familiarizes the child with the test situation. You learn also about the child's functional vision: In the rare case of myopia you will find that the child has useful vision at near and parents will not be alarmed when the child does not see well during the distance visual acuity test.

When examining normally sighted children, hold the card at 40cm (16 in), the length of the cord. Let visually impaired children use their preferred distance and head posture during the first testing, later measure at 40cm (16 in) if the child also uses that distance in visual tasks.

The more crowded test with 50% and 25% spacing between the optotypes is a sensitive test to detect the increased crowding phenomenon. 50% spacing means that the space between the optotypes is one half of the width of the optotypes. Short video of the test situation with the line test side is at Follow-up of vision development >> At the age of three years >> sequence #3.

Instruction

- Establish a method of communication such as naming (signing) or pointing (matching). Decide with the child which names will be used to identify the symbols. When needed, train with the *LEA Puzzle* (#251600), *Response Key Card* (#251700), or *Flash Cards* (#251800).
- Start with binocular testing, using the center grouping of symbols.
- Point to each of the four symbols (circle, house, apple, square) on the top line, observe the baseline responses for comprehension, speed and accuracy.
- Cover the top line with a white card (the reverse side of a flash card may be used). It is best not to cover the top line completely, but to leave the bottom half of the symbols exposed. (This maintains the "contour interaction" effect of the standardized chart layout. If this confuses the child, cover the top line completely.)
- Ask the child to identify only the first symbol on the line below the covering card.
- Repeat this procedure for each or every second line (moving quickly down the chart to avoid tiring the child) until the child hesitates or misidentifies a symbol.
- Move back up one line and ask the child to identify all the symbols on that line.
- If the child identifies all symbols correctly go to the next line down and ask the child to identify all the symbols on that line.
- If the child skips a symbol, ask the child to try again while briefly pointing to that symbol.
- The visual acuity is recorded as the last line on which at least 3 of the 5 symbols are read correctly. Always test until the threshold line.
- If the chart is held at 40cm (16 in) the visual acuity value is found in the margin adjacent to that line.
- After binocular testing, proceed with testing each eye separately. When the right eye is covered ask the child to identify the symbols grouped on the lower left of the card (lower right when the left eye is covered). Use two pairs of plano glasses for occlusion of the child's eyes or a pair of symmetric glasses that can be used for covering both eyes, one at a time. This is the least disturbing type of occluder for children.
- For monocular testing, follow the same procedure as for binocular testing.
- Older children may be tested using the reverse side of the near vision card where the same symbols are spaced more closely, as if in words or sentences. The testing procedure is the same as for binocular testing on the front of the card. The close spacing of the symbols on this test makes it a sensitive test for the detection of mild amblyopia. In children with brain damage there may be great differences between visual acuity values measured with the line test and the more

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crowded tests. - A four year old patient of mine once looked very surprised when I showed her the more crowded side of the test and said "It is impossible to look at those pictures. They hug each other." That sentence depicts the difficulty in keeping the details apart from each other when the posterior pathways are damaged. Single symbol acuity may be normal or near normal.

- Visual acuity measured with crowded symbols approximates the smallest text size that the child will be able to read. It is NOT equivalent to the print size used in learning because nobody likes to read at the level of threshold. We usually read texts that are 3-10 times larger than the threshold size.
- The test is supplied with training cards and a response key. For convenience, the test has a response key line at the bottom.

Monocular near vision testing

Monocular near vision values are important in the follow-up of amblyopia treatment. Visual acuity values often improve first at near and later at distance. Before the age of three years it is usually easier to measure monocular near vision values than distance visual acuity values.

As a part of vision screening monocular testing is of interest at the age of 6-7 years. If visual acuity at distance has become less than it was at age 4 or if there is difference between the two eyes, near vision measurement may give the following diagnosis: If the near vision values are symmetric and as before the change in distance vision cannot be caused by anything else but mild myopia, which does not need to be corrected. The child does not need to be referred. This leads to a decrease in the expenses of vision screening and simultaneously an improvement in the quality of screening.

Testing Near Vision at Shorter Distances

A child with a visual impairment is allowed to choose any distance and is given a correction for that distance, if needed. If the chart is used at a distance other than the usual 40cm (16 in)+, measure and record the viewing distance and the symbol size read (the M value) or the visual acuity value printed adjacent to the threshold line.

To determine the visual acuity use one of the following formulas:

Note that it is incorrect to report "V.A. 20/25 at 8 inches" if the child could read the 20/25-line (.50M line) at 8 inches. Visual acuity is in that case: $8"/16" \times 20/25 = 1/2 \times 20/25 = 20/50$. (When using the British notation: 6/9 line at 20cm equals: $20\text{cm}/40\text{cm} \times 6/9 = 1/2 \times 6/9 = 6/18$. When using the decimal notation 0.8 line at 20cm equals: $20\text{cm}/40\text{cm} \times 0.8 = 1/2 \times 0.8 = 0.4$.)

When the distance is one half (or one third) of the standard distance, the visual acuity value is also one half (one third) of the value printed next to that line.

If you do not want to do the calculations, report the result as M-unit value, i.e. in the previous case .50M at 8" (20cm). Visual acuity is easy to calculate based on these values: $VA = 0.2\text{m}/.50\text{M} = 2/5 = 4/10 = 0.4$ or $2/5 = 20/50$ or $2/5 = 6/15$ the closest being 6/18.

The calculation is based on metric measurements. The corresponding visual acuity values in the American and in the British notation you can also find on the visual acuity chart. If the exactly corresponding value is not printed on the chart, calculate it as follows: For example $0.07 = 7/100 = [7 \times 3/100 \times 3] = 21/300$ or $20/300$; or for the British notation: $0.07 = 7/100 = 6/86$ ($6 \times 100/7 = 86$)

You multiply both the numerator and the denominator with the number that makes the numerator equal or closely equal to 20 or 6.

20/400	6/120		🏠	□	○	□	♥								8.0 M	.05		
20/320	6/95		○	🏠	♥	○	□								6.3 M	.063		
20/250	6/75		♥	□	🏠	♥	○								5.0 M	.08		
20/200	6/60		□	🏠	♥	○	🏠								4.0 M	.10		
20/160	6/48		🏠	□	○	♥	□								3.2 M	.12		
20/125	6/38		○	♥	□	🏠	♥								2.5 M	.16		
20/100	6/30	♥	□	○	□	🏠	♥	□	🏠	○	🏠	○	□	○	🏠	♥	2.0 M	.20
20/80	6/24	🏠	○	♥	🏠	○	□	♥	○	🏠	□	♥	○	🏠	♥	□	1.6 M	.25
20/63	6/19	○	♥	🏠	□	♥	🏠	□	♥	□	○	🏠	□	♥	🏠	○	1.25 M	.32
20/50	6/15	♥	○	♥	🏠	□	♥	○	□	♥	🏠	○	□	🏠	○	♥	1.0 M	.40
20/40	6/12	□	♥	○	□	🏠	○	□	○	🏠	♥	♥	🏠	□	○	🏠	.80 M	.50
20/32	6/9.5	○	🏠	□	♥	○	□	○	□	♥	🏠	□	♥	🏠	□	○	.63 M	.63
20/25	6/7.5	🏠	♥	🏠	○	□	○	□	♥	🏠	○	🏠	♥	○	♥	□	.50 M	.80
20/20	6/6	□	🏠	○	♥	🏠	🏠	♥	□	○	♥	○	□	♥	□	🏠	.40 M	1.0
20/16	6/4.8	○	□	♥	🏠	♥	♥	🏠	○	□	○	🏠	○	□	🏠	♥	.32 M	1.25
20/12.5	6/3.8	🏠	♥	□	○	□	□	♥	🏠	○	□	♥	🏠	○	□	○	.25 M	1.6
20/10	6/3	○	🏠	♥	□	○	○	🏠	♥	□	🏠	○	♥	🏠	○	□	.20 M	2.0

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ANSWER KEY FOR #251000

20/400 6/120		5 9 8 9 6		8.0 M .05
20/320 6/95		8 5 6 8 9		6.3 M .063
20/250 6/75		6 9 5 6 8		5.0 M .08
20/200 6/60		9 5 6 8 5		4.0 M .10
20/160 6/48		5 9 8 6 9		3.2 M .12
20/125 6/38		8 6 9 5 6		2.5 M .16
20/100 6/30	9 6 5 8 5	6 9 5 8 5	5 9 5 8 6	2.0 M .20
20/80 6/24	5 9 8 9 6	9 6 8 5 9	6 9 8 9 5	1.6 M .25
20/63 6/19	8 5 6 8 9	5 9 6 9 8	8 5 6 8 9	1.25 M .32
20/50 6/15	5 9 5 6 8	6 8 9 6 5	6 9 5 6 8	1.0 M .40
20/40 6/12	6 9 8 9 5	8 9 8 5 6	9 5 6 8 5	.80 M .50
20/32 6/9.5	5 8 6 9 6	9 8 5 6 9	5 9 8 6 9	.63 M .63
20/25 6/7.5	8 6 5 9 8	8 9 6 5 8	8 6 9 5 6	.50 M .80
20/20 6/6	6 8 6 5 9	5 6 9 8 6	6 9 5 8 5	.40 M 1.0
20/16 6/4.8	9 6 5 9 8	6 5 8 9 8	9 6 8 5 9	.32 M 1.25
20/12.5 6/3.8	8 5 9 6 5	9 6 5 8 9	5 9 6 9 8	.25 M 1.6
20/10 6/3	5 9 5 8 6	8 5 6 9 5	6 8 9 6 5	.20 M 2.0

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