

# TNO test for stereoscopic vision

## manual

This test was designed primarily for screening pre-school children (age 2½ to 5 years) for defects of binocular vision. It consists of seven plates (to be viewed with the red-green spectacles) that carry figures that can be seen only when both eyes co-operate to give stereoscopic vision. Three plates (Plates I-III) enable the examiner to quickly establish whether stereoscopic vision is present at all. The three quantitative plates (Plates V-VII) may then be used for the exact determination of stereoscopic sensitivity.

When used for screening purposes, Plate V should be used as a pass-fail criterion. Various studies (see references) indicate that at the level of 240 sec. of arc at least 95% of the amblyopes are unable to see the test figures. If an increase in the number of overreferrals is acceptable, one may increase the sensitivity of the test still further, by using the next test step as a pass-fail criterion (120 sec. of arc). When administering the test, the plates should be well illuminated and presented at a distance of approximately 40 cm. It is important that the plates are placed squarely in front of the child (not rotated to the left or to the right). Spectacles should not be removed.

The plates may also be presented upside down. In that case test items will be seen in reversed depth, an effect that also may be obtained by reversing the red-green spectacles.

When all attempts have been unsuccessful in demonstrating the presence of stereoscopic vision, the child may be suffering from any of a variety of binocular as well as monocular defects. Only further examination by other diagnostic means may reveal the true nature of the defect.

**Plate I** : In this plate two butterflies can be seen, but one of them is hidden, that is, visible only when both eyes are used. The child is asked to point at each butterfly it can see.

**Plate II** : Four discs (balls, saucers), that differ in size, are present. Two of these, the largest and second smallest, are visible only stereoscopically. First ask for the smallest disc - this one always being visible -, then for the largest.

**Plate III** : Four hidden test items - a disc, triangle, square and diamond - are arranged around a central cross of different texture. The child is first asked to look at one of the examples on the opposite page and then instructed to find the corresponding figure in the test plate. In order to check whether instructions have been understood, one should always start with the cross.

**Plate IV** : This is a suppression test, showing a small disc flanked by two large discs. If the child sees only two discs, ask for the largest. The position of that disc (left of right) indicates which is the dominant eye. If the child shows a tendency to fuse the small disc with one of the larger ones, the book should be rotated over 90°, so as to present the discs in a vertical row.

**Plate V-VII** : Here the test figures (discs with a sector missing) are presented at six different depth levels (two at each level). The corresponding retinal disparities (binocular parallax) range from 15 to 480 seconds of arc (see figure). When instructing very young children it may be helpful to tell the child to put a finger in the hole where the piece of "cake" or "pie" is missing.

