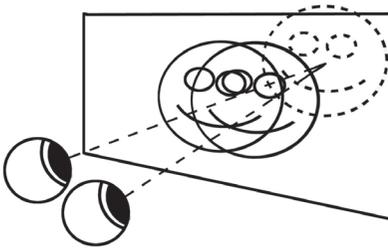
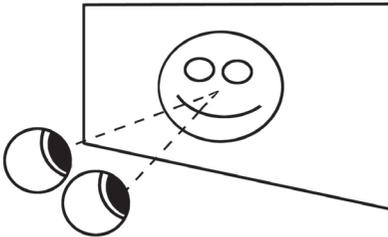


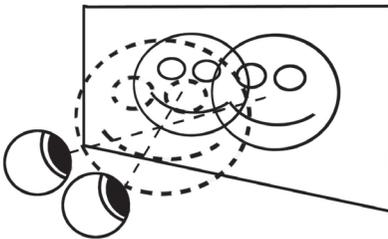
Eyes focus on a subject at infinity: No problem if the screen is several meters away.



Eyes focus on a distant subject: No problem if the screen is several meters away.



Eyes focus on a subject in the screen: No problem, whatever the distance. It's the same as watching a 2D film.



Eyes focus on a subject that is closer than the screen: Problems of perception are possible if the virtual subject is too close, regardless of the distance from the screen.

Visual and Stereoscopic Acuity

The human eye's angular resolution is on the order of a 60-second arc, which corresponds to 20,000 separate points to sweep the horizon. However, this resolution is obtained only in the central zone of vision, the fovea, and decreases towards the sides. To determine an object's distance, the brain uses the horizontal differences between the two views and is capable, under the best conditions, of detecting a parallax difference that is less than the optical resolution; ten times less, according to some sources.

To get the most out of an image projected on a screen there is thus a maximum distance that must not be exceeded, on pain of losing details and decreasing the impression of immersion and feeling of depth.

The standard SMPTE EG-18-1994 recommends a minimal field of vision of 30° for movie theaters and is widely adopted for home installations (www.smpte.org). Shorter distances enhance immersion and reduce eye strain. THX (www.thx.com) has also published a standard with which THX-labeled movie theaters comply. This standard requires a minimal field of vision of 26° for the seats farthest from the screen and an optimal value of 36°. For home cinema installations, THX recommends a slightly larger angle: 40°.

The following table gives the maximum distances from the screen for optimal viewing of 3DTV (16:9, 1920 × 1080 pixels) based solely on visual acuity or following the SMPTE (30°) and THX (26° to 36°) standards.

Interocular Distance

In the human species, the mean distance between the two eyes varies little. The interocular distance in the average adult is 65 mm for men and 63 mm for women. In children this distance is logically smaller, and an interocular distance of 48 mm is generally used.

Optimal Viewing Distance According to Screen Size

Width of the 16:9 Screen (+ diagonal in inches for HDTV)	Max Distance According to Visual Acuity (m)	Max Distance According to SMPTE (m)	Max Distance According to THX (m)	Recommended Distance According to THX (m)
70 cm (32")	1.3	1.3	1.5	1.0
100 cm (46")	1.8	1.9	2.2	1.7
110 cm (50")	2.0	2.1	2.4	1.5
143 cm (65")	2.6	2.7	3.1	2.0
3 meters	5.4	5.7	6.6	4.8
4 meters	7.2	7.6	8.8	6.3
8 meters	14.4	15.2	17.6	12.7
12 meters	21.6	22.9	26.4	19
20 meters	36.0	38.1	44.0	31.7