

Answer #232

The answer is: (1), (6), (5), (9), and (8), in that order, as seen in the sequence below and in an mpeg video by clicking on any of the photographs. The video shows the ground glass screen being pulled away from position closest to the lenses, as it passes through the points seen in the series of photographs below.



Note that because the vertical focusing is greater than the horizontal focusing the beam focuses in the vertical direction first, forming a horizontal line. The vertical line at the horizontal focus is longer because it is further from the astigmatic lens. The "average" focus, called the circle of least confusion, is not really a focus.

Astigmatism in the eye, similar to the effect shown here, is caused when the cornea is not quite symmetric, but rather has two slightly different focal lengths for two orthogonal axes. Unlike the example in this question, these two axes need not be exactly horizontal and vertical.

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