Eyesight, Aging, and the Modeler

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The eye's ability to do comfortable near work changes with age. These normal age-related changes can present many more difficulties to the modeler than the average person. The following are hints and methods of compensating for these changes so that modeling activities need not be curtailed or abandoned as the modeler ages. With these methods, the modeler can pursue detail modeling, even in the smaller scales, for hours at a time without eyestrain or discomfort.

1) Use brighter lights. Nearly 1/2 less light gets into the eye as you get older, so more light is necessary to see the same as when you were younger. More important, more light also causes the iris (pupil) to constrict, which increases the depth of field. This means that a wider range of near distances will be in focus than in dimmer light. This is why you can focus closer under bright lights than under dim conditions: the actual distance you can focus to is the same, but the depth of field is expanded to allow closer 'nearly-focused' conditions. Use a minimum of two 60 watt bulbs at 18 inches for near work or an daylight lamp (see #3 below).

2) Light up the background, too. Using a bright light, such as a reading lamp, in a dark room causes your eyes to rock back and forth between bright conditions and dark conditions whenever you look up and then back to the work. This means the muscles of the iris have to dilate and contract repeatedly, leading to eye fatigue. Even lighting throughout the room allows the iris to remain more nearly fixed reducing fatigue.

3) Use corrected spectrum (color) lights. The human eye sees and can focus best in full normal daylight. Neither incandescent lights (too much orange) nor fluorescents fit the eye's peak sensitivity. Use lighting with "Daylight" or "Full Spectrum" bulbs, for example Daylight™ Lamps, Ott-Lite®, or Verilux®.

4) Use eye drops. The human eye produces fewer tears with age. At the same time, concentration on close work causes the eye to blink much less often. This combination results in dry irritated eyes with prolong near work. The use of replacement tears, in the form of lubricant eye drops, restores comfort and allows further work. We recommend the preservative free type solutions used just before any near task and then every 20 minutes. (Refreash™, Systane™ etc)

5) Use multiple sets of reading glasses to accommodate different working distances. After age 40, the eye slowly loses its ability to accommodate or focus, limiting your near working range. Using over-the-counter drug store reading glasses allows you to set the range closer for your modeling distance.

Power	Min	Max
+0.00	39.0	infinite
+0.25	31.2	156.0
+0.50	26.0	78.0
+0.75	22.3	52.0
+1.00	19.5	39.0
+1.25	17.3	31.2
+1.50	15.6	26.0
+1.75	14.2	22.3
+2.00	13.0	19.5
+2.25	12.0	17.3
+2.50	11.1	15.6
+2.75	10.4	14.2
+3.00	9.8	13.0
+3.25	9.2	12.0
+3.50	8.7	11.1
+3.75	8.2	10.4
+4.00	7.8	9.8
+4.25	7.4	9.2
+4.50	7.1	8.7
+4.75	6.8	8.2
+5.00	6.5	7.8

The maximum and minimum working distance of a set of reading glasses are given by the center table. To determine the power for your modeling glasses 1st find the working distance in either the Max column if you are 45+ or the Min column if younger then over to the power. Add this power to the 1st number of your distance prescription.

For example; a farsighted 60 year old with a distance prescription of +1 wanting to work at 13 inches looks over to a power of +3. Adding the two values; +1 distance added to a +3 gives a modeling prescription of +4.

If you are near-sighted your glasses are diverging lenses, with a minus power, such as -2.5. Your eyes actually have a +2.5 error built-in, which is what the glasses are correcting. Removing your glasses will thus have the same effect as a normally-sighted person wearing reading glasses of the same +2.5 plus power.

If you need to work closer or you wear a higher minus power, such as -5, taking your glasses off may give you a working distance that is too short to be useful. You can still use the table to determine your modeling glasses. For a person with -5 correction and wishing to work at 13 inches, the power of the modeling glasses: -5 + +3= -2, notice it is still a minus number and may have to be ordered. For clip-on readers do not sum the powers.

6) Use safety glasses when working with power tools! None of the above will help you much if you have been blinded or scarred by shards from a shattered cutting wheel or other power tool accident. Safety glasses or "Polycarbonate lenses" should always be used when using a Dremel or other high-speed tool to protect your sight.

7) Healthy living healthy eyes. Don't smoke, use UV protection in all eyewear and take vitamins formulated for the eye (Ocuvite™)