Near visual acuity conversion

True-size lines of print from 8.0M to 0.4M, with Snellen and point size equivalents.

EyeKnow O.D.
CLINICAL REFERENCE

PRINT AT TRUE SIZE
for use at 40 cm (16 in) with customary reading correction, if needed

M SIZE	SNELLEN	ARIAL pt	EVERYDAY
8.0M	20/400	64	Main headline
6.3M	20/320	50	
5.0M	20/250	40	
4.0M	20/200	32	Small headlines
3.2M	20/160	25	
2.5M	20/125	20	Children's books
2.0M	20/100	16	Large-print books
1.6M	20/80	12.7	
1.25M	20/63	9.9	Books
1.0M	20/50	8.0	Newspaper
0.8M	20/40	6.4	OTC drug labels
0.63M	20/32	5.0	Ads, Bibles
0.5M	20/25	4.0	
0.4M	20/20	3.2	

Bright eyes

New glasses

He read every row

Her frames fit just right

Sunglasses on a sunny day

One or two, the doctor kept asking

The classic eye chart has one big letter on top

He squinted at the bottom line and guessed the last word

Grandma keeps a spare pair of readers in the kitchen and the car

The optician warmed the earpieces and bent them until the lenses sat level

Each blink spreads a thin film of tears over the front of the eye. It leaves that surface smooth and clear.

The pupil is the black opening in the middle of the iris. It shrinks in strong light and widens in the dark.

The lens inside the eye stiffens with age. After forty-five, most people hold small print farther away to see it.

The best-known rows of shrinking letters are more than a century and a half old. Clinics around the world keep using the same design.

50 mm

Print at 100% scale. The bar at left must measure 50 mm, or the lines are not true size.

M SIZE	8.0M	6.3M	5.0M	4.0M	3.2M	2.5M	2.0M	1.6M	1.25M	1.0M	0.8M	0.63M	0.5M	0.4M
Letter (mm)	11.6	9.16	7.27	5.82	4.65	3.64	2.91	2.33	1.82	1.45	1.16	0.92	0.73	0.58
Times New Roman pt	74	58	46	37	29	23	18	14.7	11.5	9.2	7.4	5.8	4.6	3.7
Snellen 6 m at 40 cm	6/120	6/95	6/75	6/60	6/48	6/38	6/30	6/24	6/19	6/15	6/12	6/9.5	6/7.5	6/6
Decimal at 40 cm	0.05	0.063	0.08	0.10	0.125	0.16	0.20	0.25	0.32	0.40	0.50	0.63	0.80	1.00
logMAR at 40 cm	1.30	1.20	1.10	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.00
VAR at 40 cm	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Jaeger, Rosenbaum				J16			J10	J7 (20/70)		J5	J3	J2	J1	J1+

Letter height
$1000\ \text{mm} \times \tan 5' \times M = 1.454\ \text{mm} \times M$
1.0M print subtends 5 arcminutes at 1 m.

Arial point size
$$\frac{1.454\ \text{mm} \times M}{0.3528\ \text{mm/pt} \times 0.5186} = 7.95\ \text{pt} \times M$$
Arial's lowercase height is 0.5186 of its point size.

Snellen at 40 cm
$$\frac{0.40\ \text{m}}{M} = \frac{20}{50 \times M}$$
rounded to a chart step

logMAR at 40 cm
$$\log_{10} \frac{M}{0.40}$$
in rows of 0.1 log unit, a factor of 1.26