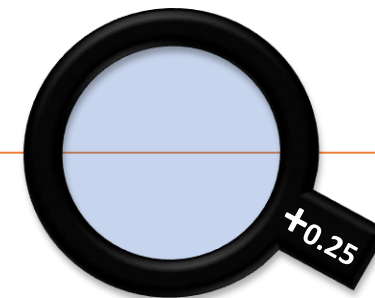
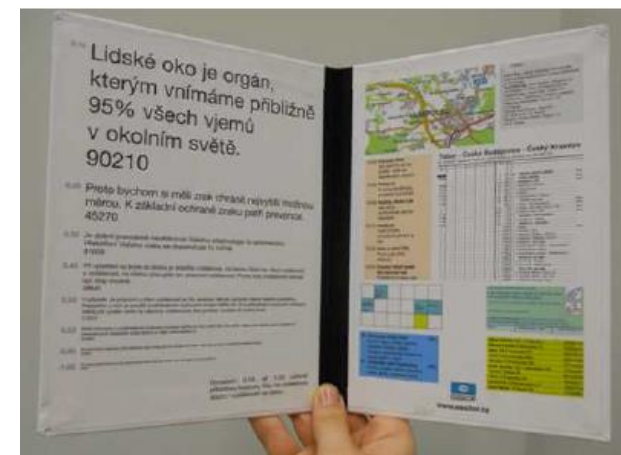


# Visual Acuity



VISUS	
<b>E C</b>	$\frac{6}{36} = 0,17$
<b>B T Z</b>	$\frac{6}{24} = 0,25$
<b>F C L B O</b>	$\frac{6}{18} = 0,33$
<b>T O E B H F C</b>	$\frac{6}{12} = 0,5$
<b>Z E B H C L F O B</b>	$\frac{6}{9} = 0,67$
<b>C B F Z E T F B O C Z E</b>	$\frac{6}{6} = 1$
<b>E Z C O B F C H E L B Z</b>	$\frac{6}{5} = 1,2$

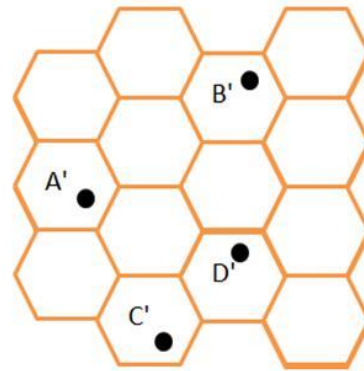


# Visual Acuity

- Definition: ability of the visual system to detect spatial changes
- Performed at viewing distance of 5 or 6 m and 40 cm for near

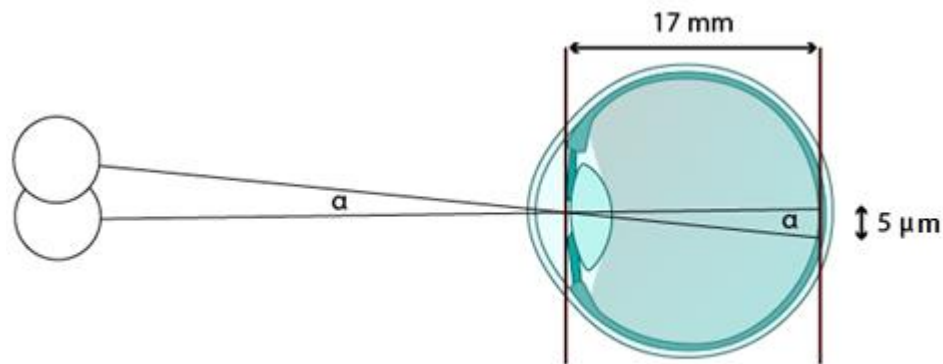
# Minimum separabile

- Emmetropic eye: we can only distinguish two points from one another if there is between two cones irritated to the retina one cone not irritated
- These two cones are observed at an angle of one minute



# Minimum separabile

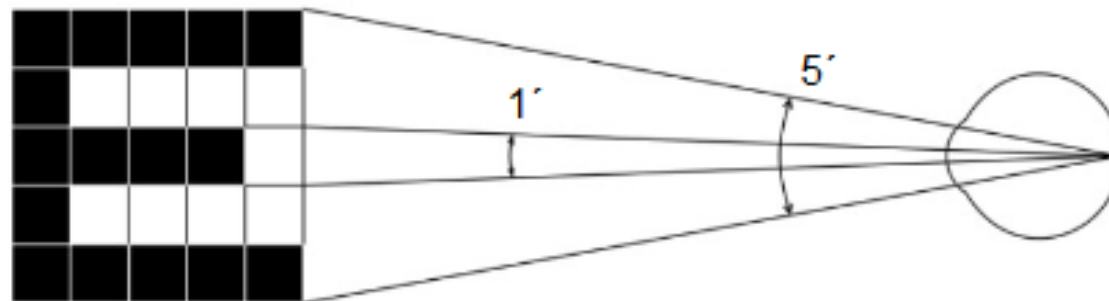
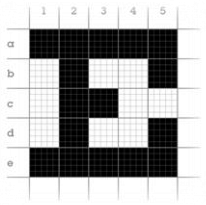
- The average length of a cone is approximately 0,005 mm and the retinal distance from image modal point of the eye is approximately 17 mm. The angular distance still distinguishable points are:
- $\text{tg}\alpha = 0,005 / 17 \rightarrow \alpha \approx 1$  angular minute



$$\text{tg}\alpha = 0,005 / 17 \Rightarrow \alpha = 0,0167^\circ = 1 \text{ úhlová minuta}$$

# Evaluation of visual acuity

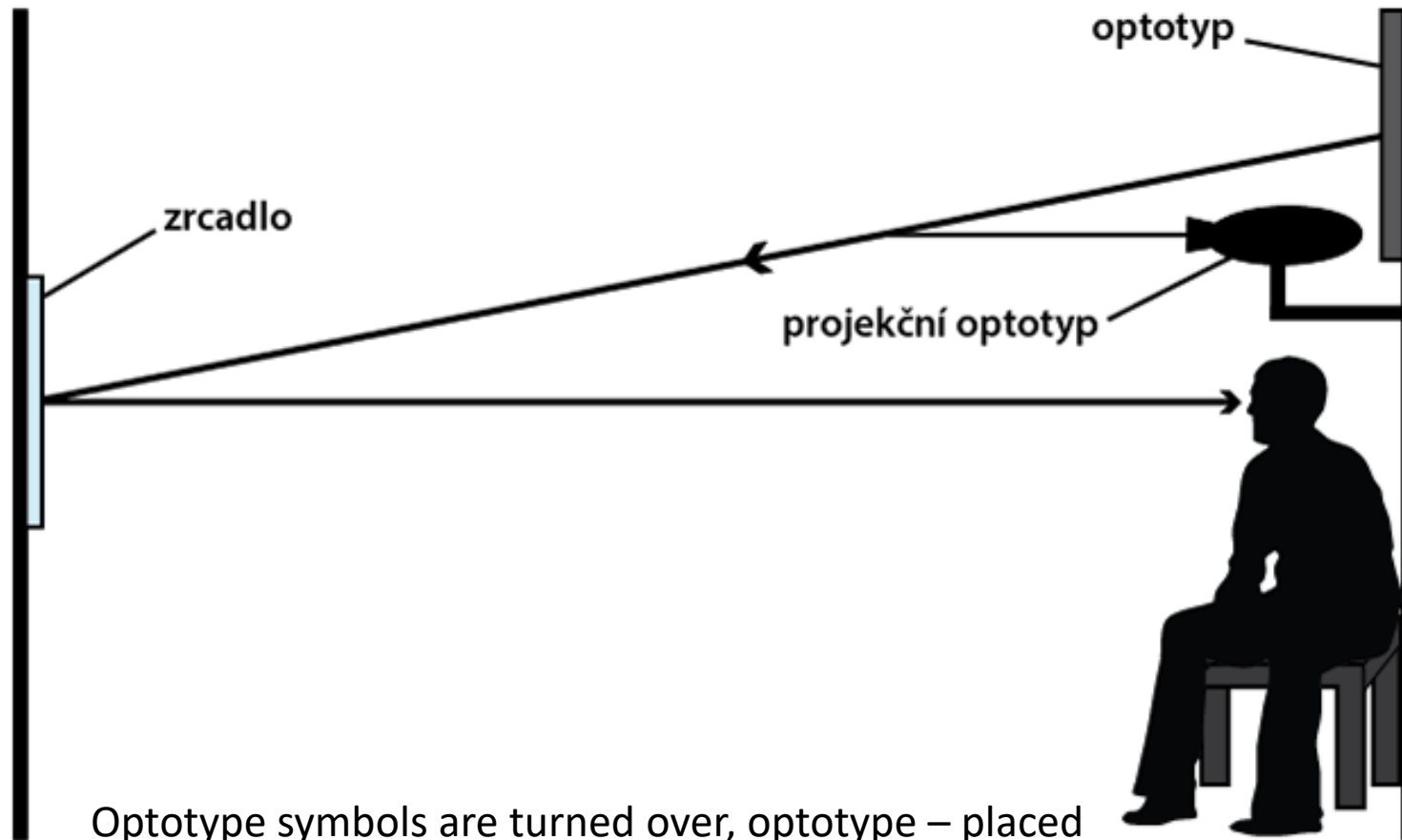
- used to measure the visual acuity during clinical refraction- **optotypes**
  - Snellen optotypes: letters, numbers, pictures, symbols
- Each symbol is inscribed in a square visible from a specified distance below the viewing angle of  $5'$
- The symbol thickness (not size) is equal to one fifth of the square and corresponds to angle of  $1'$
- Examination distance: 5 m or 6 m (the eye is in the rest, the accommodation is less than 0,25 D – the eye is looking to infinity, it does not accommodate)
- We measure first the right eye and then the left eye



# Optotypes

- According to the design: printed panels, light panels, projection charts and LCD optotypes, 3 D charts
- Snellen, Pflüger, Landolt, pictures, LEA, ETDRS optotypes
- The most of optotypes charts have the range of visual acuity – 1,6 - 0,1

# Projection optotype with mirror image



Optotype symbols are turned over, optotype – placed over the patient's head, opposite the patient is the mirror at eye level

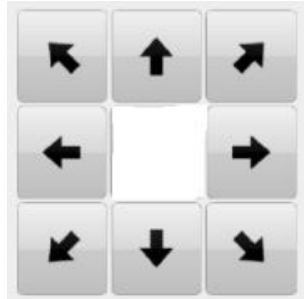
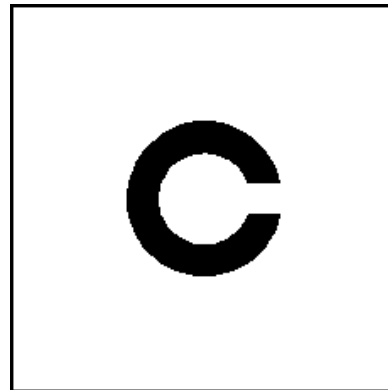
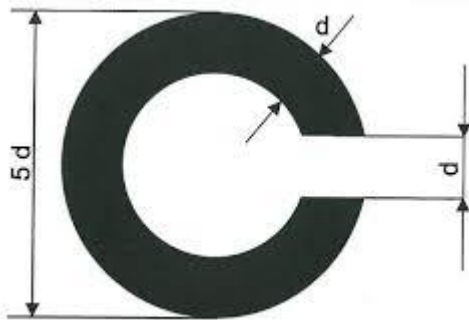
# Snellen optotypes

- Herman Snellen (1834 –1908)
  - a Dutch ophthalmologist
- 1862 – Snellen optotypes
- 6/60, 6/36, 6/24, 6/18, 6/12, 6/8, 6/6, 6/5, 6/4
- The signs: C, D, E, F, L, N, O, P, T, Z
- The patient have to identify minimum 60% of the optotype sign at the line



# Landolt C optotype

- is recommended by the ICO
- is the standard optotype ( C – a standardized symbol) for acuity measurement in most European countries. It was standardized.
- The Landolt C consists of a ring that has a gap, thus looking similar to the letter C ( The width of the gap and the thickness of the line of the symbol is  $\frac{1}{5}$  of the diameter, and the gap width is the same)
- 8 different positions of the gap (comparison to the positions of a clock face)



# Pflüger E (hooks) = (Tumbling E test)

- Can be performed on children or patients who do not speak the same language as the practitioner
- The directions of E in 4 ways (up, down, right or left side)
  - higher probability of guessing
- The aid: the child's hand or E in (rotation of the direction the letter E)



# LEA SYMBOLS

- **Homework** – please write me, what are Lea symbols, why and at whom we use them for, you can attach the pictures of Lea symbols...

