EYE ~ VISION ~ BRAIN
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ABOUT US

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Vision Care

Eye sight difficulties

Eye health

Vision development

Developmental Optometry

Glasses

Vision Therapy

Visual skills

Behavioural Optometry

Prevention, protection, enhancement of visual system
Sensory System

How much information do each of our senses process at the same time?

Vision 83 %
Hearing 11 %
Smell 3.5 %
Touch 1.5 %
Taste 1 %
(Rosenblum et al)
Vision is our dominant sense.

“The brain receives about 3 million bits of information at every moment, and 2 million of these are from vision” V Ramachandran, a neuroscientist known primarily for his work in the fields of behavioural neurology and visual psychophysics.
Eye & brain connection

Retina

Rods and cones
Fovea: 1 mm in diameter
0.2 mm area of cones
(6-7 million) - colour
(75-150 million) rods - black and white
PROPRIOCEPTION is the sense of the orientation of one's limbs in space.
Common complaints

Rubs eyes frequently

Headaches

Holds book close

One eye turning in/out

Uses finger to keep place when reading

Reading / learning difficulties / Dyslexia

Reverses letters / numbers / words

“The words are blurry”

“The words move”

“I’m tired”

“I can’t!”

ASD

Developmental delays

3, 5, 7, 9, 6
b, d, p, q, s, j, g
saw, was
Visual skills
**Vision**

**Definition:** the comprehensive ability to organise what is seen, so that it can be understood and used to guide and direct one’s actions to interact with the world.

It is a dynamic process that involves the combined skills of aiming, tracking, focusing and teaming, together with mental, emotional and neurological processes.

“Sight is what our eyes see. Vision is what our mind understands what we see.”

R Robinson, MD, MPH, Clinical Professor of Paediatrics USC (CA)
• Ability to see clearly at near and far distances
• Tests - eye charts 20/20 or 6/6 acuity (at 6 m)
• Can have good distance but poor near acuity
• Eye health
• Long sighted
• Short sighted
• Amblyopia (Lazy eye)
• Strabismus (eye turn)
COORDINATE AND ALIGN EYES PRECISELY SO THAT THE BRAIN CAN PUT TOGETHER THE IMAGES FROM EACH EYE. SLIGHT MISALIGNMENT CAN RESULT IN DOUBLE VISION.

- **Normal**
- **Divergent Excess**
- **Over Convergence**

- Side glancing
- Closes one eye
- Poor depth perception
 Ability to adjust focus of the eyes as the distance from the object varies. Eg. – Copying from board to book.

 Ability to keep focusing clearly on close work - sustaining focus. Eg. Is the print on a book clear all the time?

 “fuzzy”, “looking like under water”, “fizzy”, “blurry”

 Blinks a lot  

 Slow in copying tasks
- ability to point eyes accurately and be able to keep the eyes on target whether the object is moving or stationary.
- Saccadic eye movements (fully developed at age 5, for reading texts) e.g. reading a line of text.
- Pursuit eye movements—eg. following a ball in flight
- Vergence movements
- Vestibulo-ocular movements
VISUAL PERCEPTION
CAUSES

- EYE ~ VISION ~ BRAIN

BIRTH HISTORY

- DEVELOPMENTAL DELAYS
- MOVEMENT
- CRAWLING
- CREEPING
- LATE / EARLY WALKER

MEDICAL HISTORY

- GENETIC
- SERIOUS ILLNESS
- TRAUMA

ENVIRONMENT

- STRESS FROM PROLONGED CLOSE WORK / SCREENS
Teacher

MG Age 7y 10 m
Behind in reading, comprehension, writing and spelling
Unable to recognize same word in isolation

Oral Reading age 5.5 y
Word Recognition Age 4.5 y
Word Decoding Age 5.1 y
Comprehension Age 6 y
Spelling Age 5.7 y
Phonological Test - normal except for rhyme production
PM Reading level : 14
Maths Age 6.9 y

Visual Assessment
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- normal eye sight & C V
- poor convergence
- poor focus flexibility skills
- poor right left body awareness and postural stability
- poor eye tracking, language automaticity poor

Visual Perception Tests
Overall age 8-7
Significant difficulties in form constancy 5 y 6 m
figure ground 5 y 1 m
-consistent with teacher’s observations

Parent

Headaches
Reversals with ‘b’ and ‘d’ s
Writing difficulties
Not recognising sight words in reading

Treatment
- glasses for close work
- exercises for eye tracking
- discussion with teacher to incorporate visual strategies, automatic sight word recognition and spelling, looking for words within words, visualising techniques, core muscle exercises (gym), music and art.
• Look for signs and symptoms, early detection and intervention extremely beneficial - check list

• ‘The only thing worse than being blind is having sight but no vision’
  Helen Keller.