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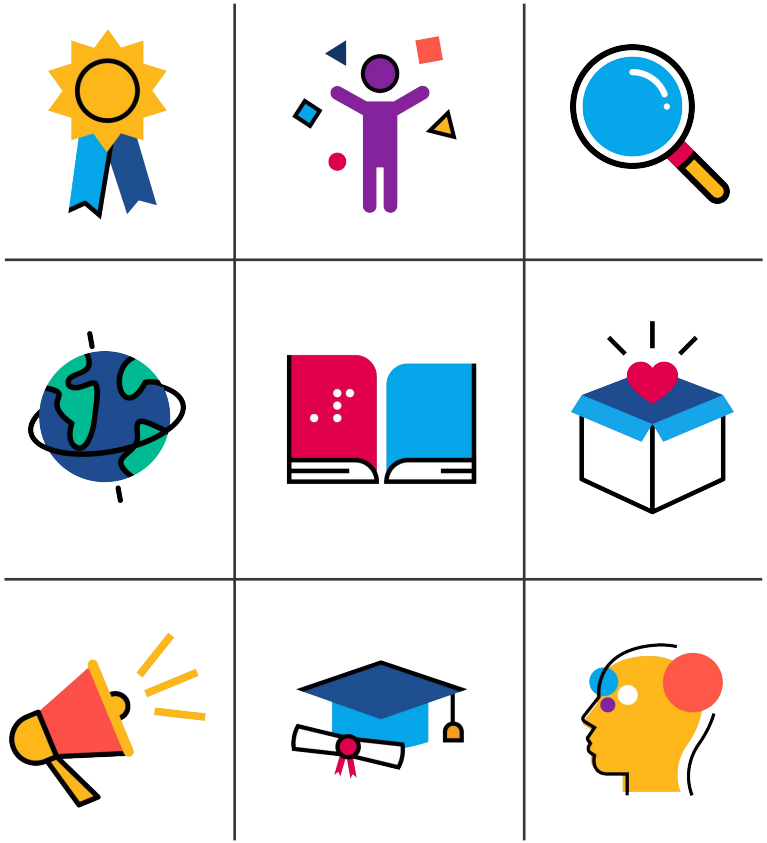
Perkins School for the Blind

# CVI Visual Behaviors
# Part-1
# November 18, 2022



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# Our Evolving CVI Philosophy

- Entered CVI by using an assessment
- Limited understanding of the visual brain
- Limited awareness of other theories
- One way to do assessment
- One way to create educational programming

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# Perkins CVI History

Perkins has a growing number of students diagnosed with CVI of different kinds.

Needed a comprehensive plan

- For improving assessment
- For improving educational programming

Convened Colab in November 2018

- International stakeholders sharing views
- Discussed the “Wicked Problem of CVI”
- Identified key areas to focus our work

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# Perkins CVI History

Convened a CVI Symposium in 2019: Panel discussions and Working Groups

- Needs in ***CVI Assessment***
- Needs in the ***Training of TVIs*** and others working with children with CVI.
- Needs in ***Advocacy***: Local and National
- Needs in the ***Medical and Research*** fields.

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# Perkins CVI History

Formation of a CVI Center Strategic Plan:

- Gathered information about the prevalence of CVI
- Identified what, where and when we could add value to the field.
- Identified four pillars (Resarach, Advocacy, Education, Trainings)

# Current CVI Philosophy

- Children with CVI are visually impaired.
- Assessment must cover the wide variety of manifestations of CVI.
- No child has “mild CVI”.
- No scoring can capture the functional vision of the child since no child can be compared to another nor to children with typical visual skills.
- No child is approaching typical vision.

# Current CVI Philosophy

- CVI is often one piece of a child's complex diagnosis and it is commonly found among children with other types of brain involvement or metabolic issues.
- The community need a broader background understanding of CVI.
- Assessment tools must looks at more than vision since the goal is learning access.
- Research must support any assessment tool being used.

# Current CVI Philosophy

- Acknowledge the unique nature of each individual's CVI.
- Recognize and formalize the preeminence the of parent in assessment and educational programming.
- Assess the visual and compensatory skills of the whole range of manifestations of CVI.
- Ensure that no child is missed and no sensory skill is overlooked as a support or a distraction to their learning.
- Be grounded in research.

# Current CVI Philosophy: Collaboration

We need to collaborate for assessment and program planning.

- Engage the child in assessment
- Tap into the parent knowledge
- Seek medical information: All diagnosis, ocular and neurological
- Share functional vision and compensatory skills information with the medical provider
- Seek educator and related service provider knowledge

# Current CVI Philosophy

- Must acknowledge that most children with CVI have co-existing ocular conditions
- Assessment can not be a moment in time. Assessment must be ongoing.
- Progress must be monitored with careful data taking
- Assessment should consider visual skills, compensatory skills, and strategies children have developed to just survive and understand their world.
- Assessment must look at the whole child including their motor, cognitive, behavior and social-emotional skills that influence learning.
- Children can fool us into thinking we are looking at visual recognition

# Current CVI Philosophy

- The brain is complex: More than 10 things can go wrong.
- Each child is unique in their brain involvement, in their visual experiences after involvement, in their compensatory skill use, in their language, motor and memory abilities.
- Each child is unique in their ***possible*** ability to develop or recover visual skills.

What exactly is “improvement”?

# “Surviving CVI” Identify in Assessment

Use of unique ways they have learned to navigate and function with their perception of the world.

Every child develops ways to function based on

- Visual skills
- Compensatory skills
- Memory
- Prediction
- Shape coding and color coding
- Self talk or seeking narration

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# File review provides a basis

- Medical reports
- Ophthalmology reports
- Low Vision clinic reports
- Previous Teacher of Students with Visual Impairments reports
- Educational evaluations
- Related Services evaluations (Physical Therapy, Occupational Therapy, Speech and Language Therapy, Behavior support reports, Orientation and Mobility Reports, Developmentalist reports, Deafblind Specialist reports, Special educator reports, General Education reports.
- Current IEP

# Parent Interview Identifies

- Strengths and supports to visual understanding

- Likes and dislikes

- Parent Interview identifies the way a child reliably responds:
- uses language
- uses behavior
- uses upper limbs
- uses lower limbs

# CVI Functional Vision Report

- Parent, student and team information
- Student background
- Ocular history and vision changes
- Neurological History
- Medical History
- Diagnosis status
- Learning Media Results: File Review
- Functional vision assessment for ocular conditions
- Functional vision assessment for visual behaviors and compensatory skills
- Recommendations for ocular and cortical/cerebral issues.

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# CVI Functional Vision Report

Ocular recommendations: Glasses and care of glasses, benefits of patching, accommodations for low contrast sensitivity, considerations for nystagmus, optic nerve differences, strabismus, light sensitivity.

CVI specific recommendations presented within these categories:

- Physical Positioning
- Materials
- Learning Environment
- Access to People
- Presentation and Access

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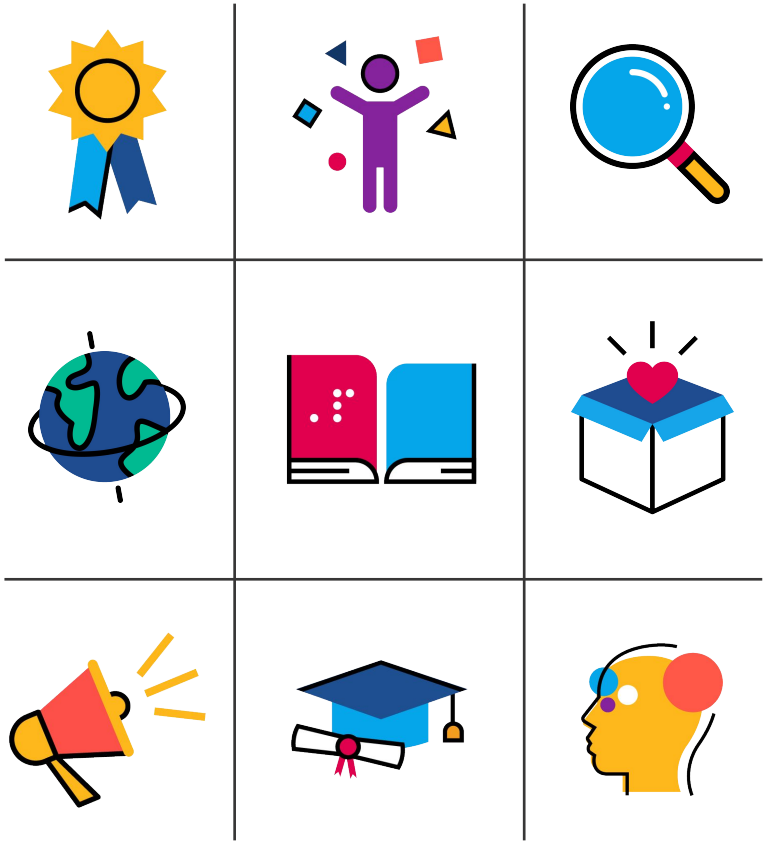
# CVI Visual Behaviors

## Perkins CVI Protocol



# The Function of the Eye vs the Brain

- We see based on our brain's interpretation of what we're looking at

- To see, an image gets sent from our eye to the primary visual cortex at the back of the brain, through the optic nerve and optic radiations.
  - The primary visual cortex interprets the image and then sends the information to other parts of the brain to get greater meaning from what is being seen.
  - These other areas determine the image's location, movement, what it is, and what it means.
  - Ventral & dorsal stream processing

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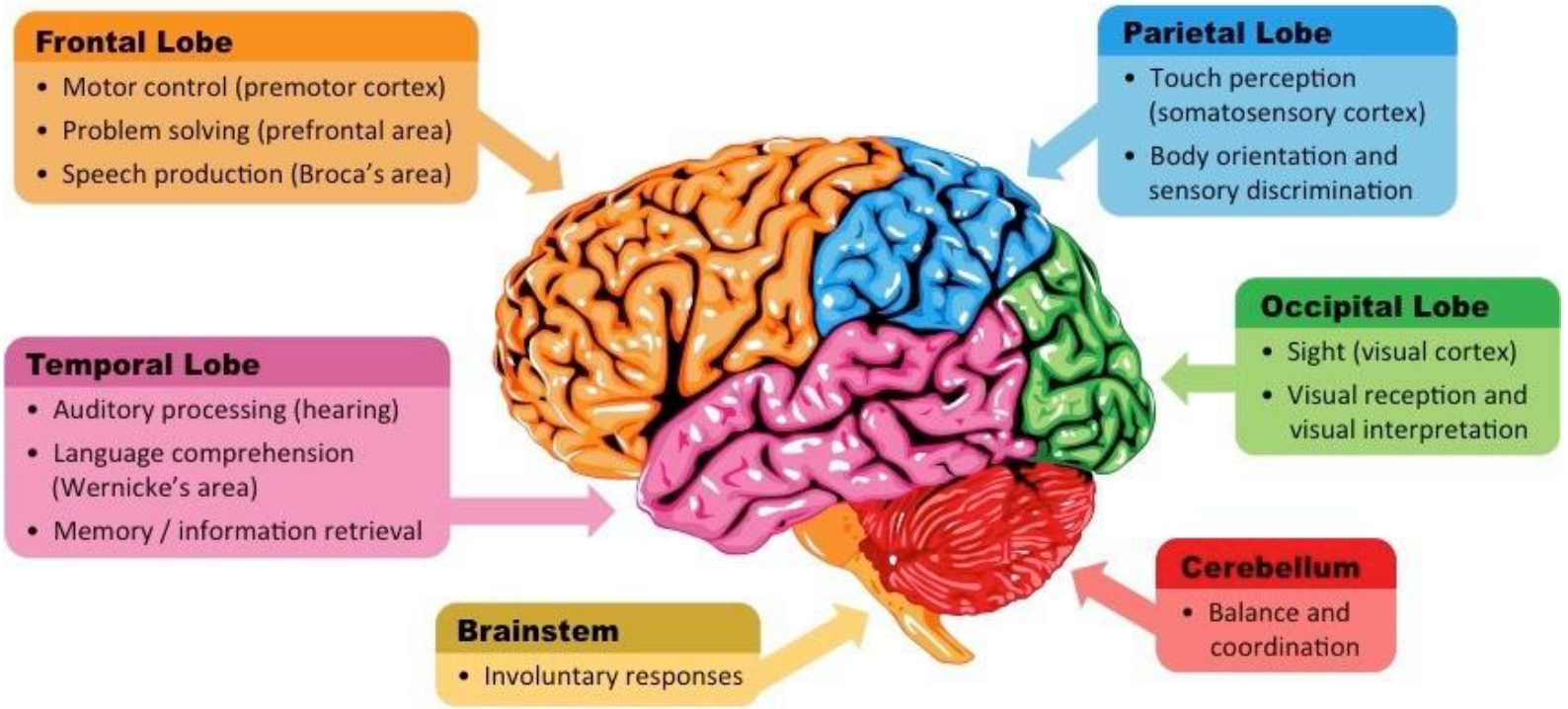
Awareness of your surroundings occurs only when sensory inputs violate expectations. When the world is successfully predicted away, awareness is not needed because the brain is doing its job well.

-David Eagleman-

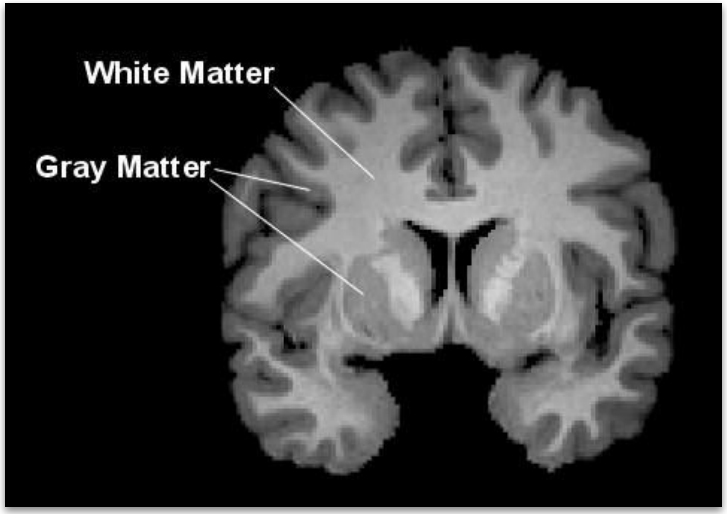
# The Brain


Frontal Lobe
• Motor control (premotor cortex)
• Problem solving (prefrontal area)
• Speech production (Broca's area)
Parietal Lobe
• Touch perception (somatosensory cortex)
• Body orientation and sensory discrimination
Occipital Lobe
• Sight (visual cortex)
• Visual reception and visual interpretation
Temporal Lobe
• Auditory processing (hearing)
• Language comprehension (Wernicke's area)
• Memory / information retrieval
Cerebellum
• Balance and coordination
Brainstem
• Involuntary responses

# Grey and White Matter

Gray Matter: processes information

White Matter: transmits information




https://www.eurekalert.org/news-releases/805067

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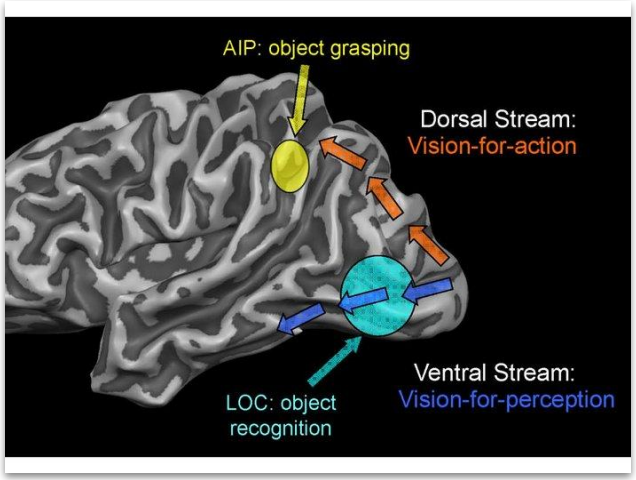
# Interconnectivity: Dorsal and Ventral Streams

- Dorsal stream:
  - Peripheral vision
  - Responds to movement and light
  - Finding items in space; visual-motor skills; processing movement and light

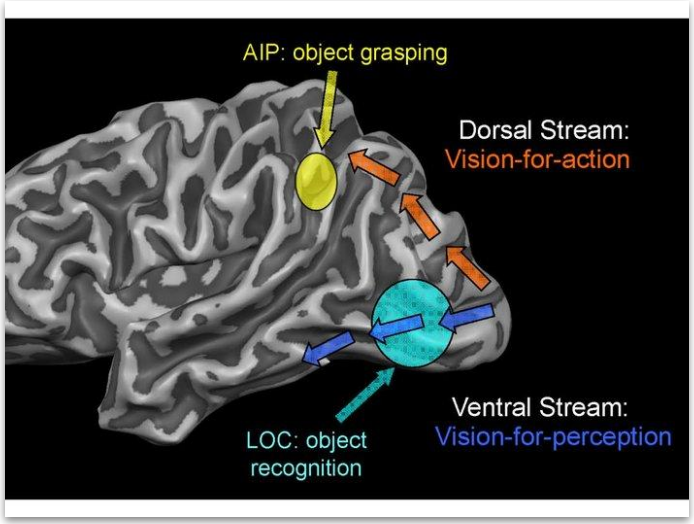
- Ventral stream:
  - Allows for fine detail vision
  - Visual recognition and object identification; ability to see details




https://www.researchgate.net/figure/The-two-visual-streams-hypothesis-Goodale-Milner-1992-The-dorsal-stream-shown_fig1_48269062

# Interconnectivity: Dorsal and Ventral Streams

- These two streams are connected in the brain.
  - Neither system acts alone.
- Both are typically impacted for students with CVI
- As the brain develops, the integration between the two systems strengthen




https://www.perkins.org/cvi-now/understanding-cvi/higher-order-visual-pathways-and-the-cvi-brain

# Common causes of CVI

- Hypoxic ischemic encephalopathy (HIE) (in the term born infant)
- Periventricular leukomalacia (PVL) (in the preterm infant)
- Traumatic brain injury due to shaken baby syndrome and accidental head injuries
- Neonatal hypoglycemia, infections (e.g. viral meningitis)
- Epilepsy/seizure disorders
- Metabolic disorders
- Certain genetic disorders or variants
- Abnormal Brain Conditions  (i.e. Polymicrogyria, Agenesis of the Corpus Callosum, Microcephaly)
- Hydrocephalus (when fluid builds up in the brain)
- Brain damage from prematurity
- Neurological disorders
- Maternal addiction to drugs and alcohol
- Cytomegalovirus (CMV)
- Stroke

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(Boston Children's Hospital; National Eye Institute/NIH; Phillip & Dutton, 2014)

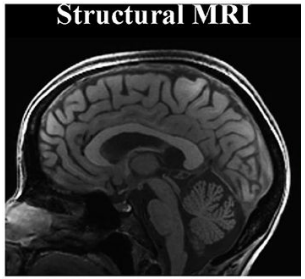
# Conditions associated with CVI

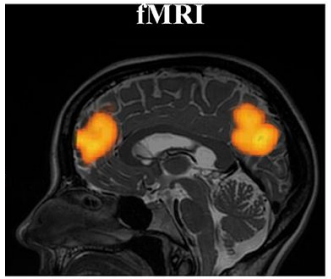
- Premature birth
- Developmental delays
- Cerebral palsy
- Hydrocephalus
- Williams syndrome
- Autism spectrum disorder
- Down Syndrome
- CDKL5 Deficiency Disorder
- Rett syndrome
- Other genetic syndromes: trisomy 21, congenital disorder of glycosylation (CDG) type 1A, complex II deficiency, copper storage diseases, infantile neuroaxonal dystrophy, Pelizaeus-Merzbacher syndrome, Mowat-Wilson, West, and Pitt Hopkins syndrome
- Genetic variants:
  AHDC1, NGLY1, NR2F1, PGAP1,ACP6, AMOT, ARHGEF10L, ATP6V1A, DCAF6, DLG4, GABRB2, GRIN1, G RIN2B, KCNQ3, KCTD19, RERE, SLC1A1, SLC25A16, SLC35A2, SOX5, UFSP2, UHMK1, ZFP30, ASTN-1



(Phillip & Dutton, 2014; Bosch, et al., 2014; Olson, 2021; Wilton, et al, 2021)

# MRIs & Brain Injury




## Limitations

- MRIs look at structure.
- fMRI's look at function in relation to a specific task

An individual with CVI may have a history of brain injury and an atypical MRI.

OR

They may have no evidence of brain injury!

https://www.frontiersin.org/files/Articles/497245/fnhum-14-497245-HTML/image_m/fnhum-14-497245-g001.jpg

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# Visual Perception

## Introductory Overview

- Form Constancy
- Color Perception
- Depth Perception
- Motion Perception
- Facial Perception

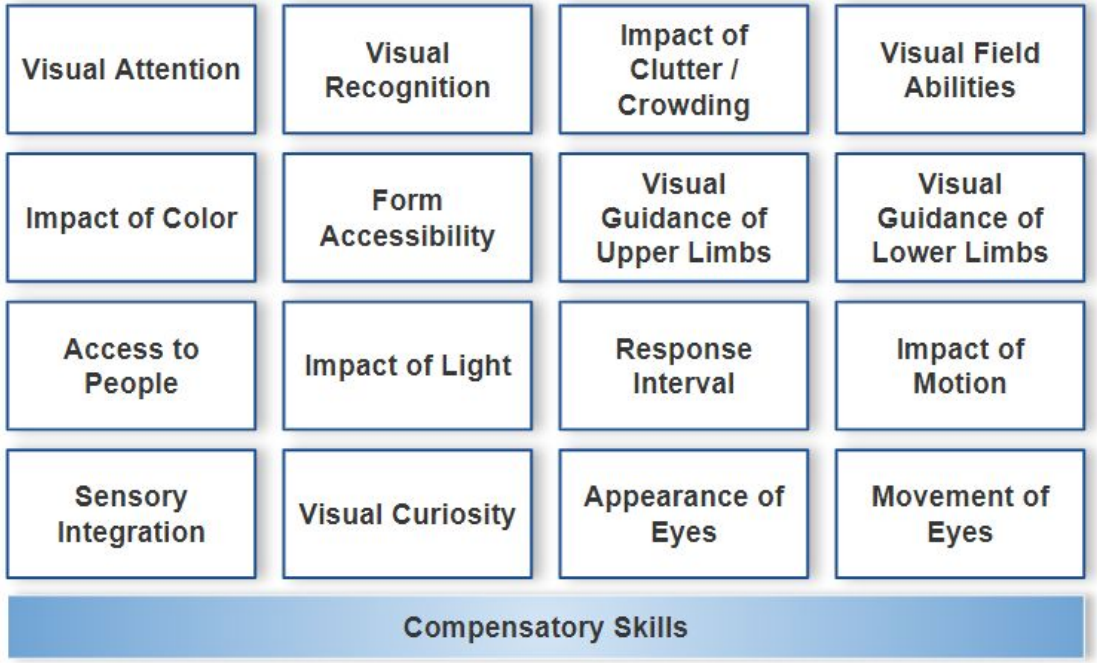
What are they in terms of **typical** processing?

What happens when the processing is **atypical**?

CVI: Observable Behaviors & Considerations

# Perkins CVI Protocol

## Areas of Assessment

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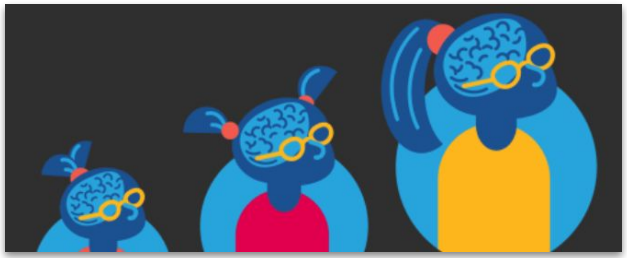
# 16 Areas of Assessment

## Why these areas?

- Research-based:
  - Neurological anatomy and physiology
  - Science behind visual perception
  - CVI visual behaviors/areas of implication



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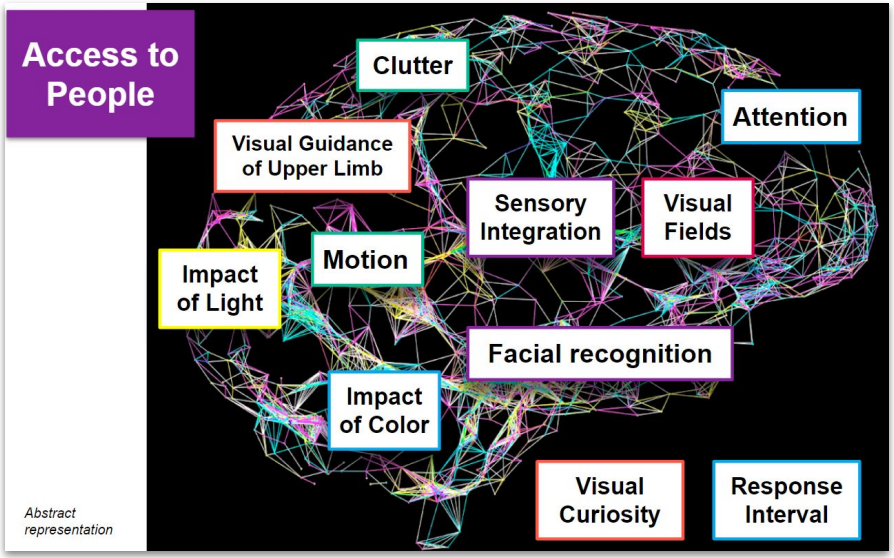
# Visual behaviors do not occur in silos

## Assessment Protocols that consider the interconnectivity of the brain




**Access to People:**
*This assessment area focuses on the student's visual behavior surrounding attention to faces, facial recognition, and interpretation of facial expressions and body language. Additional points of observation relate to the impact of crowding.*

Gabby demonstrates difficulty with attending to faces and facial recognition. She primarily identifies others based on non-visual cues, such as by contextual predictability and voices. Gabby will occasionally establish eye contact, but it is often brief. She will orient her eyes towards the faces of her parents, but will typically direct her gaze at their hairline. Gabby's difficulty with visual attention and motion perception make it difficult for Gabby to interpret facial expressions, gestures, and in air sign language. Visual clutter, movement, and loud environments further disrupt Gabby's access to this visual information; she will often place her head down in these environments and becomes less available to instruction. Gabby does best with verbal instruction that is provided prior to visual stimuli; she will look away from communication partners while they speak. She benefits from increased time to process verbal instruction and then attend to lessons that require tactile or visual access. Gabby becomes startled when approached rapidly and from her left visual field due to a documented field loss.

# “You don’t perceive objects as they are. You perceive them as you are.”

- **David Eagleman** -

- We need to understand how each child is uniquely impacted by CVI.
  - What sensory information is the brain receiving?
  - What is the child’s personal and educational history?
  - How is each child using their senses to organize and make sense of visual information and new learning?

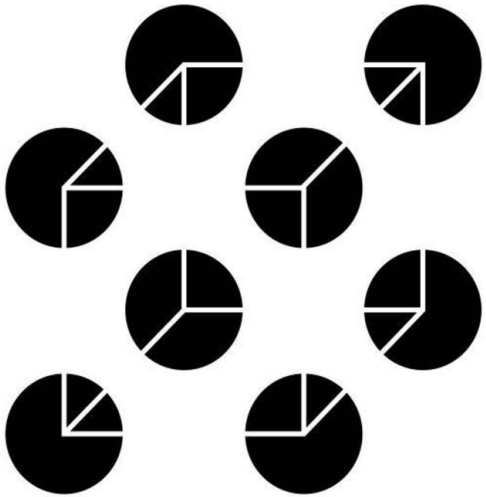
# Perception

**Bottom-up processing:** begins with the retrieval of sensory information from our external environment to build perceptions based on the current input of sensory information. Requires no previous knowledge or learning.

**Top-down processing:** the interpretation of incoming information based on prior knowledge, experiences, and expectations. Your brain adds meaning; what you perceive based on what it knows or expects. Our interpretation is based on the context in which the information appears.

# Top-Down & Bottom-Up

**What do you see?**



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# What is this item?

The neural network of a CVI brain is “fundamentally different.”

– Dr. Lotfi Merabet -

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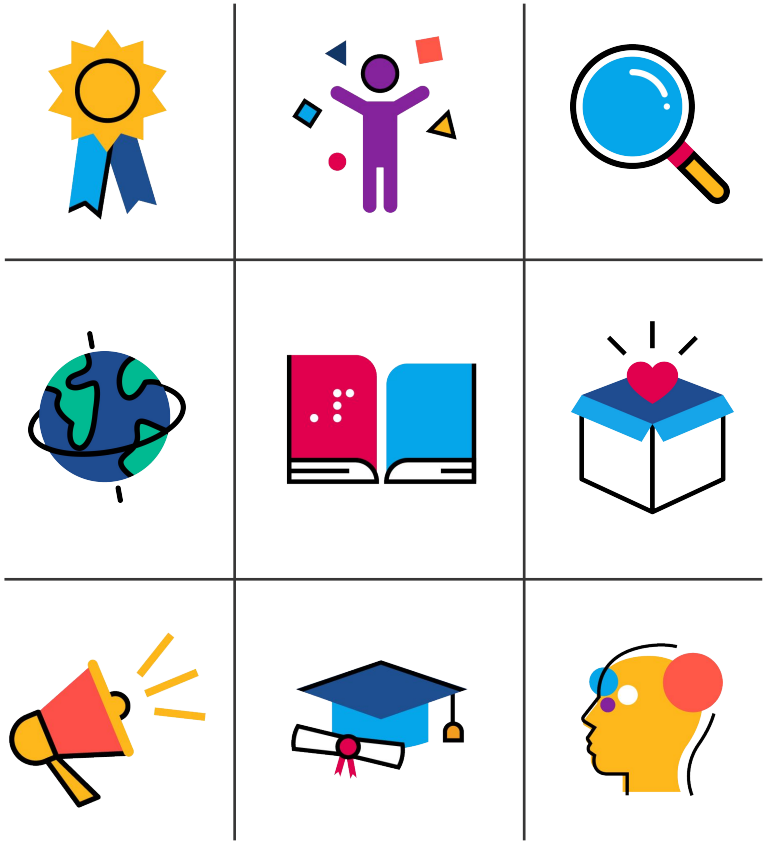
# Visual Attention & Recognition



# Areas of Assessment

## Visual Attention

- This assessment area assesses overall visual attention skills and sustained visual attention skills needed to locate and recognize materials.

## Visual Recognition

- This assessment area evaluates the student's visual recognition skills with considerations for form, distance, familiarity, environment, context clues, and auditory/tactile cues.

**Group 1**

**Last Names:  A- L**

- Count how many times the ball is passed between the people wearing white shirts

**Group 2**

**Last Name: M-Z**

- Just watch the game/check out the scenery.


Selective Attention: https://www.youtube.com/watch?v=vJG698U2Mvo

# Visual Attention

- Our visual system allows us to
  - visually search for targets among competing distractors,
  - attend to this target while ignoring other stimuli,
  - and then match the target to our visual library to support the speed and efficiency of recognition.
- When searching for an object, it's not just about where to look, but also where ***not*** to look.
- The brain has to keep track of what it's looking for and ignore information that is not relevant.
- Damage to the parietal or occipital lobes can cause difficulty with visuospatial attention, sustained attention, selective attention, and visual search, which allows us to focus and filter the visual information world around us, and only focus on the important stimuli

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(Dutton and Zihl, 2015; Merabet, 2021)

# Visual Recognition

- What forms can the student recognize visually?
  - Under what circumstances/conditions?
  - Are abilities generalizable?
- How does distance impact vision? Is the child visually curious and demonstrating recognition?
- Does the student demonstrate visual “attack skills” around familiar features?
- What other senses does the student use to gain information and learn?
- Is visual recognition being masked by compensatory strategies?

# Attention & Recognition

- What is visual attention?
- What is visual recognition?
- How do they impact one another?
- What factors:
  - support visual access?
  - impede visual access?

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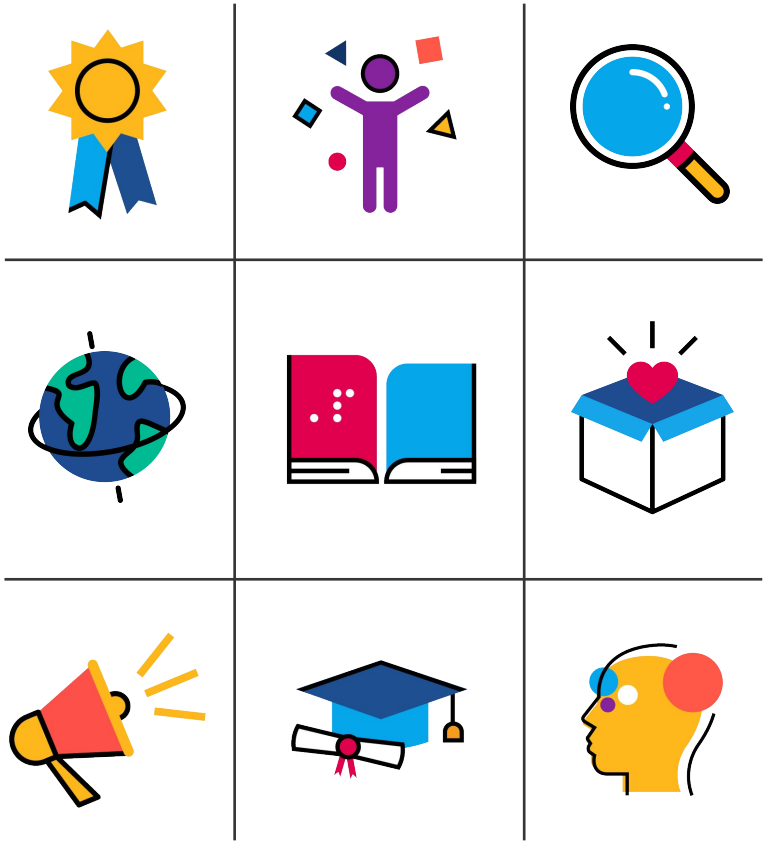
# Visual Curiosity



# Visual Curiosity

## Perkins CVI Protocol

- This assessment area looks at the incidental access of the student. In new and unfamiliar environments, visual curiosity in all fields and visual curiosity at distance is determined.

→ Linked to all areas of the CVI Protocol.

# Incidental Access

- Individuals who are sighted learn an enormous amount by simply observing the world around them.
- Individuals with CVI (and others who are visually impaired) need to be directly taught these same skills.
- Multisensory learning and hands-on experience is beneficial.

# Providing Access

## All sensory input supports brain development.

From Eagleman's *Livewired: The inside story of the ever changing brain* (2020)

- "It turns out that it doesn't matter how the information gets to the brain as long as it gets there… Whatever information the brain is fed, it will learn to adjust to it and extract what it can… [a]s long as the data reflects something important about the outside world."

# Full access supports concept development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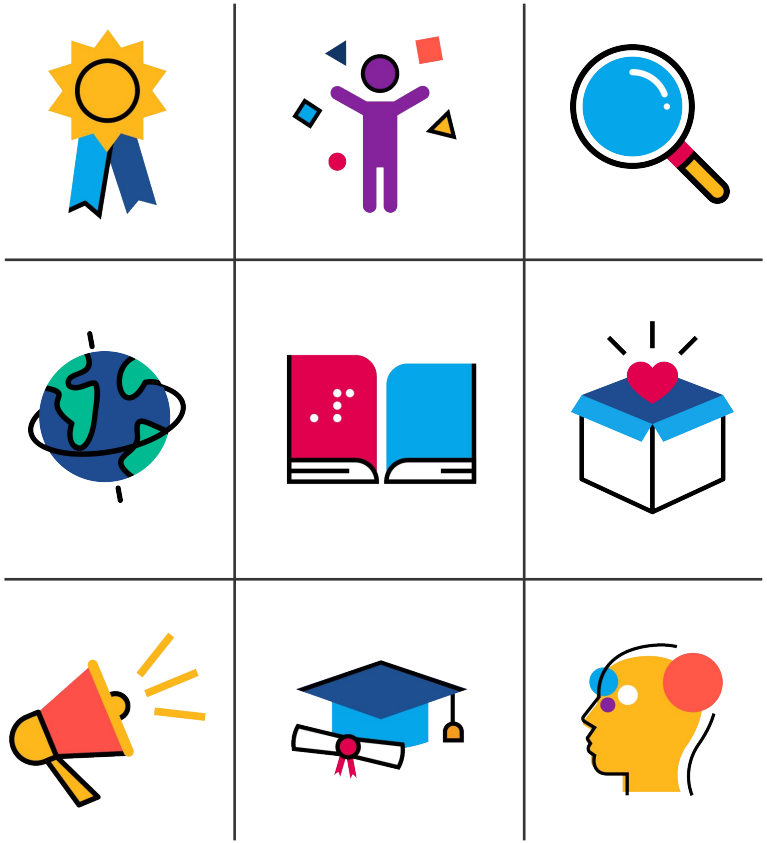
# Impact of Light



# Impact of Light

## Perkins CVI Protocol

- This assessment area evaluates a student's awareness and attention to light sources (target lighting, back lighting, environmental lighting). This area also evaluates the impact of backlighting on visual attention and recognition and defense to direct input.

→ Linked to all areas of the CVI Protocol: special attention to Attention, Recognition, Visual Guidance UL/LL, Form Accessibility, Compensatory Strategies.

# Impact of Light

## What we know

- **Not all** students with CVI engage in light-gazing behavior.
- **Not all** students with CVI benefit from backlighting.
- Students with CVI may demonstrate photophobia.
- Visual attention to light sources in individuals with CVI may be involuntary.

# Light & Shadow


*Video: National Geographic, Brain Games*

# Impact of Light

- Light impacts:
  - Form perception
  - Clarity
  - Depth
  - Color
  - Contrast
- Light is constantly shifting and changing.

**Students with CVI:**

- Share that vision is unpredictable.
- May require specific lighting conditions for attention and recognition.
- May experience fatigue when using materials with light (Response Interval).
- May have difficulty with locating objects in bright or dim environments (Impact of Clutter, Impact of Color).
- Rely on light as a landmark (Compensatory).
- May have difficulty with depth perception in areas that are not well lit (Visual Guidance of UL/LL).
- Show fear or aversion to shadows (Motion, VGUL/LL)

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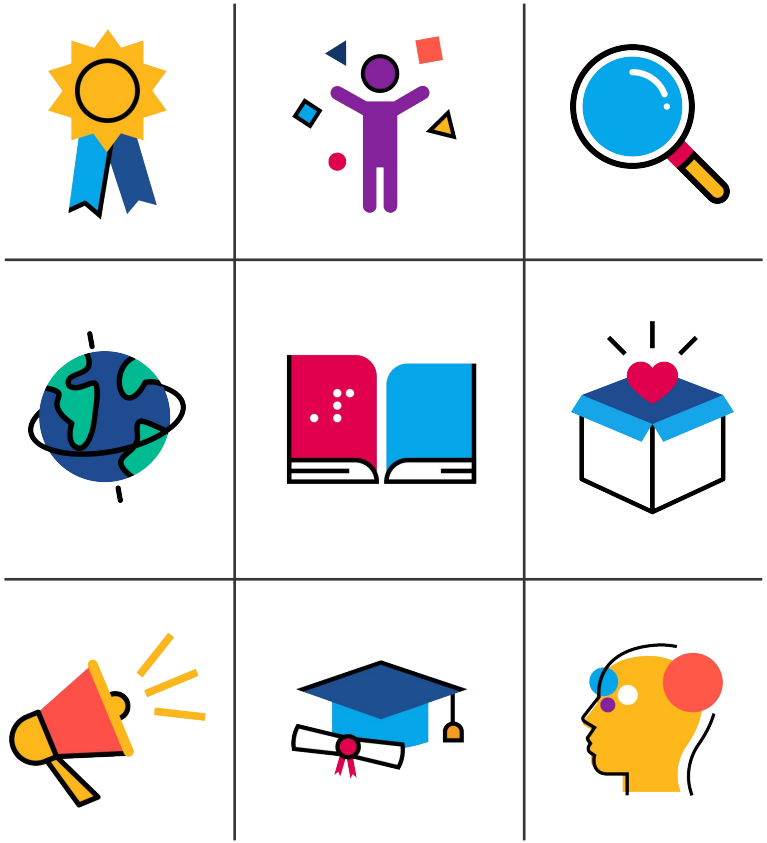
# Impact of Color



# Impact of Color

## Perkins CVI Protocol

- Evaluates the impact of color as it relates to awareness, attention, and/or visual recognition. Impact of color is monitored in relation to the impact of crowding (too many colors) and color-coding skills.

→ Linked to all areas of the CVI Protocol: Special attention to Attention, Recognition, Impact of Clutter, Form Accessibility. Compensatory Strategies.

# Impact of Color

## What we know

- **Not all** students with CVI have a “preferred” color.
- There is limited research around CVI and color.
  - Limited study suggests that individuals with CVI have increased visual attention to bright colors (Cohen-Maitre, 2015).

- General Research:
  - Suggests that V4 is responsible for color.
  - Color identification under different illuminations was impaired when V4 was lesioned (Foster, 2010).
  - V4 is involved in both color and form processing (Goebel et al, 2012).

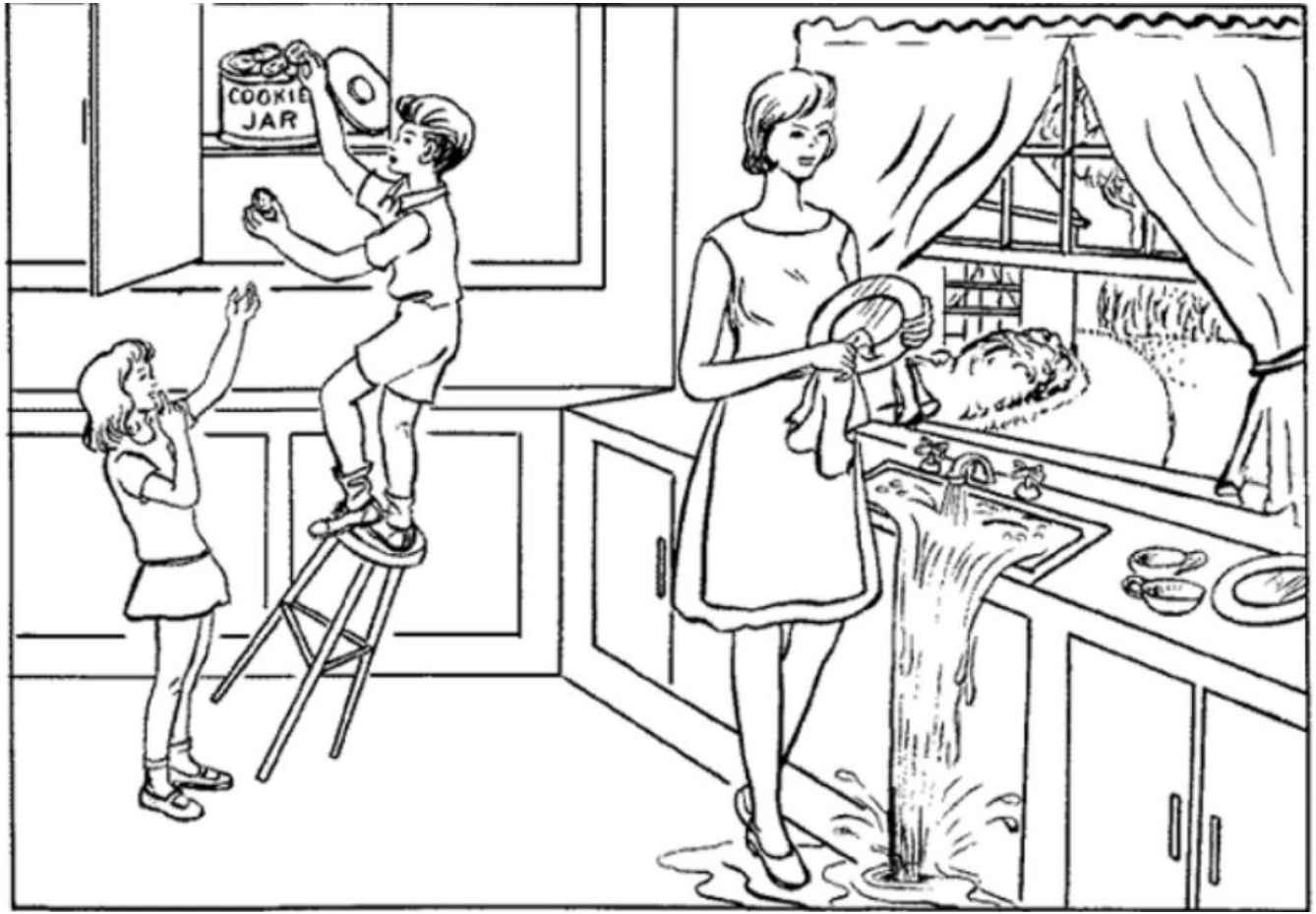
# Impact of Color

- The familiar color of a well-known object has an influence on how we perceive that object's color, which is known as the **'memory color effect'**.
- This effect requires that the object is strongly associated with a typical color and that the beholder is highly familiar with the object.
- How strongly a particular object refers to a typical color through memory colors is called **color diagnosticity**.

**Students with CVI:**

- Often depend on predictability and consistency.
- Often have difficulty with new visual information.
- May initially (or consistently) rely on color over form, i.e. color-coding (Compensatory).
- Recognition impacted by too much color (Impact of Clutter).
- Difficulty with attention/recognition to color under various lighting conditions (Light, Impact of Clutter)

A young adult with CVI
Was able to describe this
Scene in explicit detail…

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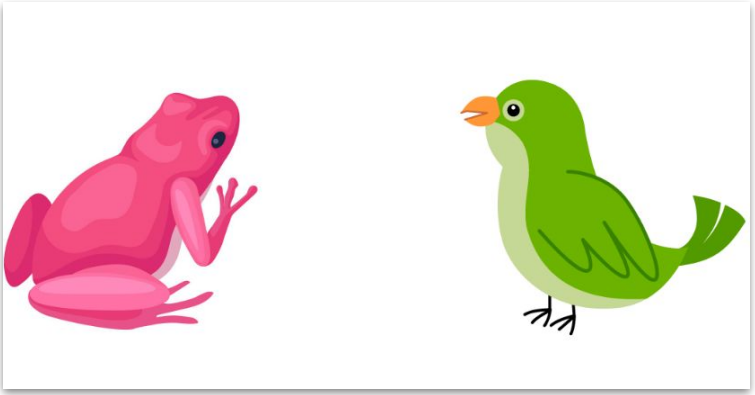
# Voice of CVI

“I want to tell you that color pops out to me a lot. For example, [referencing a Target bag] this brown is more prevalent, but the red really stands out in my brain. The reds, blues, whites, everything with color pops out. I can see it better. It’s more prevalent in a room compared to beige, dark things, like black or other dark colors like brick. Color draws attention to a lot of things.”

# Color Reliance & Support



*“Where is the frog?”*

*“The cup is pink.”*

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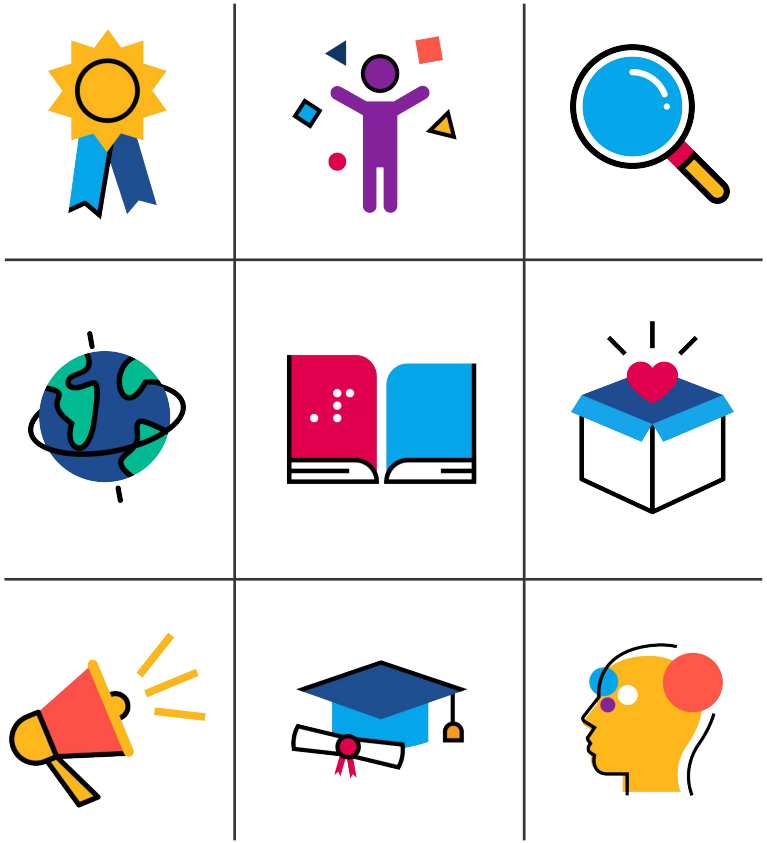
# Visual Fields



# Visual Fields

## Perkins CVI Protocol

- This assessment area evaluates the availability of the student's visual fields (peripheral and central) as it relates to awareness, established and/or maintained attention, and recognition.

→ Linked to all areas of the CVI Protocol. Special attention to Attention, Recognition, Visual Guidance of Upper/Lower Limbs, Visual Curiosity. Compensatory Strategies

# Simulation

Turn your head so that the computer is in either your left or right peripheral field.

Tell us what you see!


(University of Cambridge, 2022)

# Visual Fields

- **Our central vision supports detail vision.**
- **Peripheral fields alter to motion** and gross color.
- Superior, inferior, left, right and quadrants.

**Students with CVI:**

- May trip or bump into low furniture
- May bump into door frames on one side
- Miss curbs and other changes in depth
- Neglect one side of a book or food on one side of their plate.
- Miss details if unable to establish and maintain visual attention.
- May have an observable head tilt or posture.
- May use whole head movements to compensate.
- May attend to one target, but not be able to notice a competing target presented in the lateral field.

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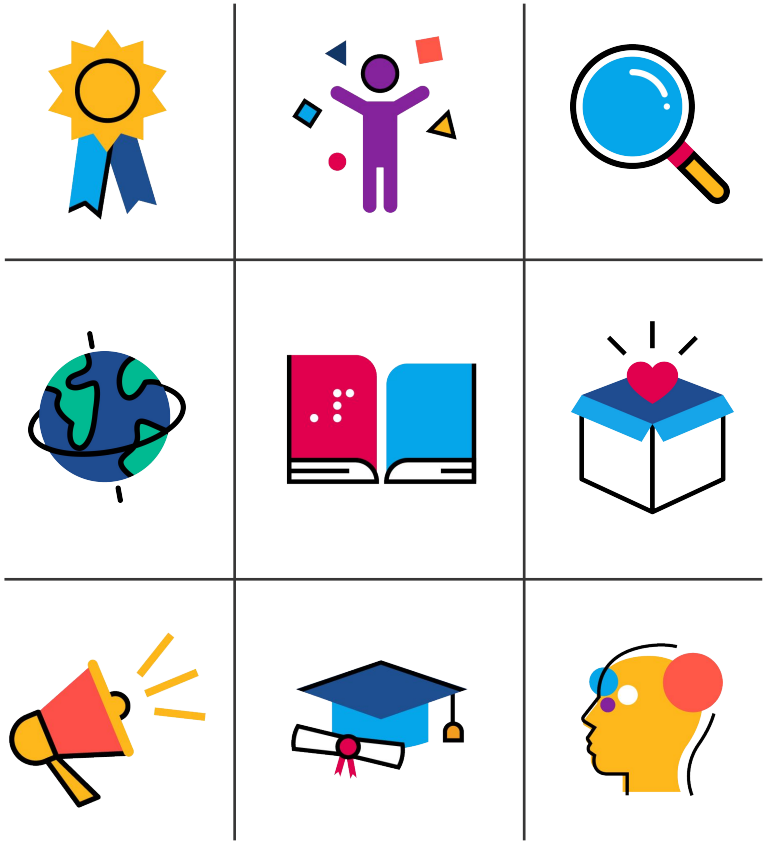
# Impact of Clutter/Crowding/Spacing



# Impact of Clutter/Crowding/Spacing

## Perkins CVI Protocol

- This assessment area evaluates the student's ability to attend to, recognize, and/or navigate materials or learning environments with varying levels of clutter.

→ Linked to all areas of the CVI Protocol. Special attention to: Attention, Recognition, Visual Guidance of Upper/Lower Limbs, Form Accessibility, Visual Curiosity, Sensory Integration and Impact on Vision, Compensatory Strategies.

# Impact of Clutter

## What we know

- Clutter can cause an individual with CVI to lose conscious control of eye movement.
- Clutter is not something that individuals can visually master.
- Ability to attend or recognize visual information varies and is impacted by internal and external states.
- Most scenarios in life involve clutter. Compensatory strategies are a must.

# Simultanagnosia

- Damage to the parietal or occipital lobes can cause difficulty processing simultaneous visual information and difficulty shifting gaze between elements of a scene.
- **Simultanagnosia:** is characterized by an inability to appreciate the overall meaning of a complex picture or stimulus, with preserved perception of isolated elements or details within the stimulus. (difficulty seeing a whole picture or a whole scene).
- Individuals with CVI might focus on one small part of a scene and miss another (larger) part entirely.

(https://cviscotland.org/documents.php?did=1&sid=38)

# Crowding in the Peripheral Fields

# Let’s make it CVI friendly!

Bright yellow!

Simple images

Black background

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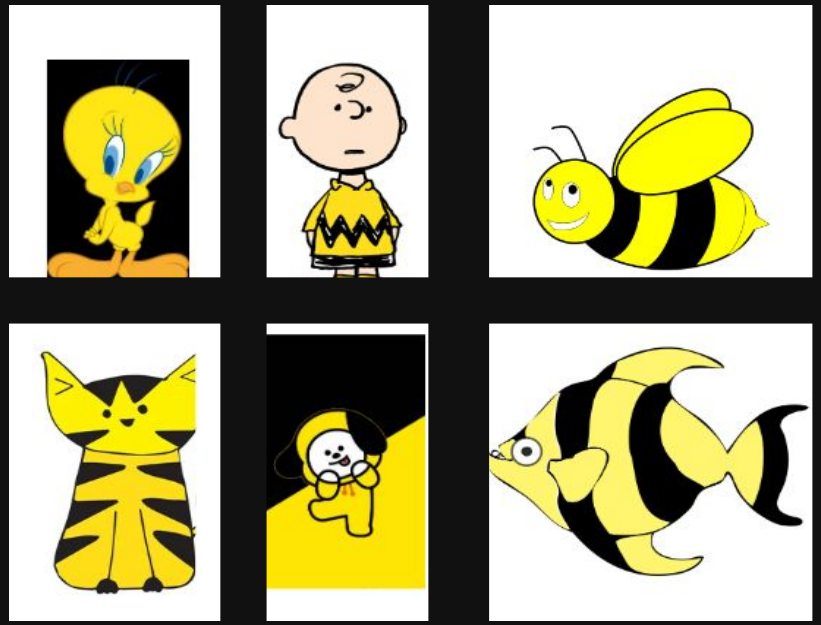
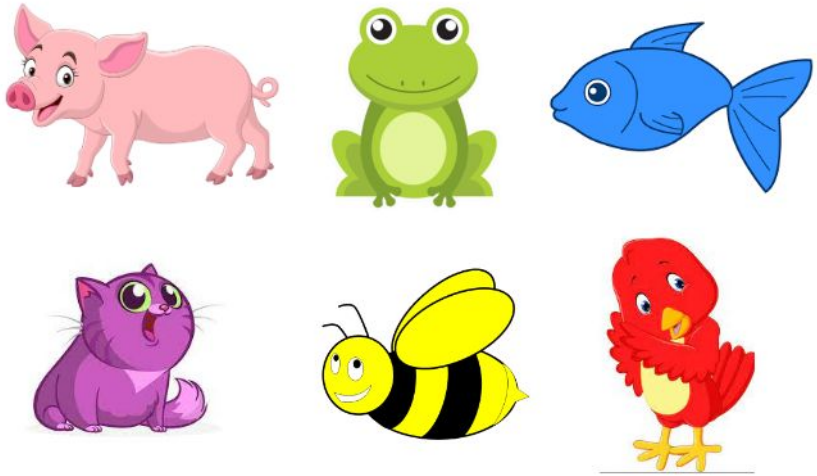
# Point to the Bee



# Point to the Bee

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# Impact of Clutter/Crowding

- In order to gain visual information, our brains engage in **parallel processing**. It's the ability of the brain to simultaneously process incoming stimuli of differing quality. Parallel processing is associated with the visual system in that the brain divides what it sees into four components: color, motion, shape, and depth.
- We can quickly glance around a scene and make connections to understand the totality of the situation or arrangement.

**Students with CVI:**

- May engage in **serial processing**. "With an increased visual load, individuals with CVI have to grind it out, as opposed to having that instantaneous capture of information we see with a really efficient visual system." (Response Interval)
- May recognize an object when in isolation, but not when presented among other objects.
- May see parts, but not the whole.
- Describe a scene in list format over the connections.
- Heavily rely on context, color, location, auditory, touch cues to navigate through clutter.

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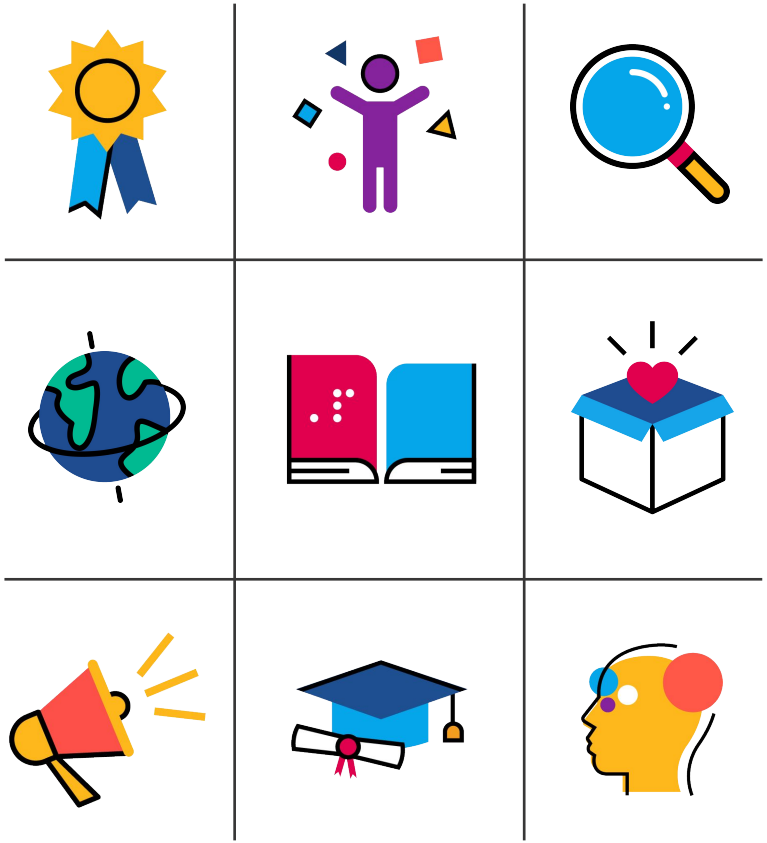
# Sensory Integration & Impact on Vision



# Sensory Integration & Impact on Vision

"So in a sense, I have taught my brain to be more conscious of my surroundings, even when my vision is limited by clutter, but there is a flip side to doing this. When I am doing this, I can't do anything else, like talk or listen to music, as any distractions takes my focus away from responding to what I am seeing."

- Nicola McDowell -

CVIScotland.org

# Sensory Integration & Impact on Vision

## Perkins CVI Protocol

- This assessment area evaluates the impact that simultaneous tactile and/or auditory input has on visual efficiency.

→ Linked to all areas of the CVI Protocol.

# Sensory Integration

- At the lowest level, sensory information is mapped separately in the visual and auditory cortexes. Following this, this information is automatically integrated in the parietal lobe, which is located in the upper area of the brain.

- We have hundreds of trillions of connections between neurons, and it's the continuous altering of this circuitry to "match the demands of the environment" that make up the "dynamic system" of the brain.

**Students with CVI:**

- Often have difficulty integrating more than one sense.
- May need to use one sense at a time. Others may be able to use multiple. This can be dependent on the situation or event.
- Reduced eye to object contact when looking or listening.
- May have visual skills that vary on positioning and support.
- Crying or having meltdowns in busy or loud environments
- Be impacted by an inability to parallel process.

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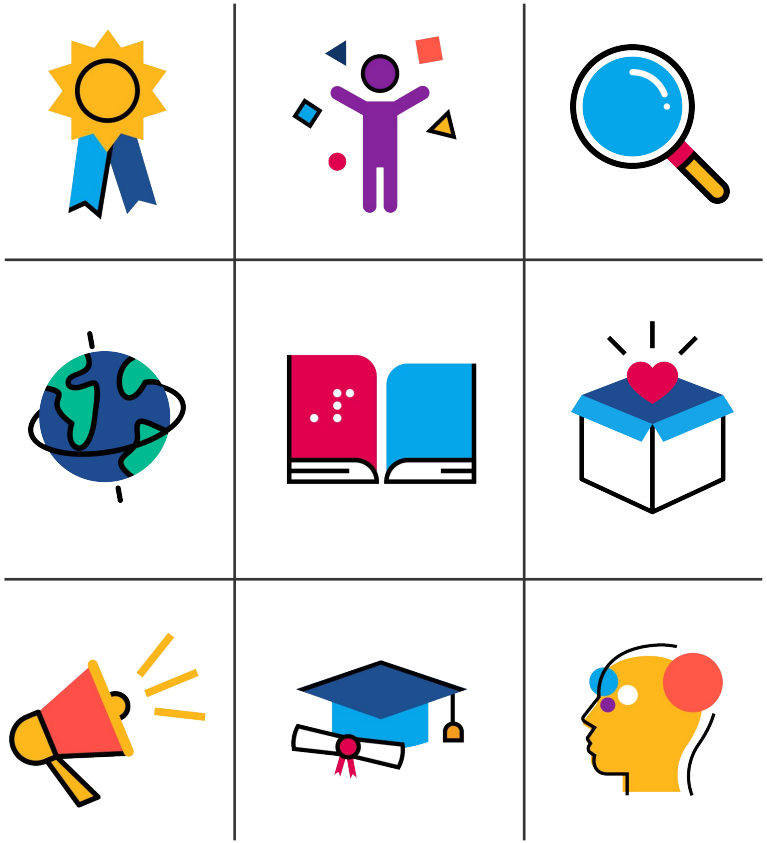
# Visual Guidance of Upper/Lower Limbs

## Depth Perception and Motion Processing



# Areas of Assessment

## Perkins CVI Protocol

### Visual Guidance of Upper Limbs

- This assessment area evaluates visual motor skills in relation to hand-eye coordination.

### Visual Guidance of Lower Limbs

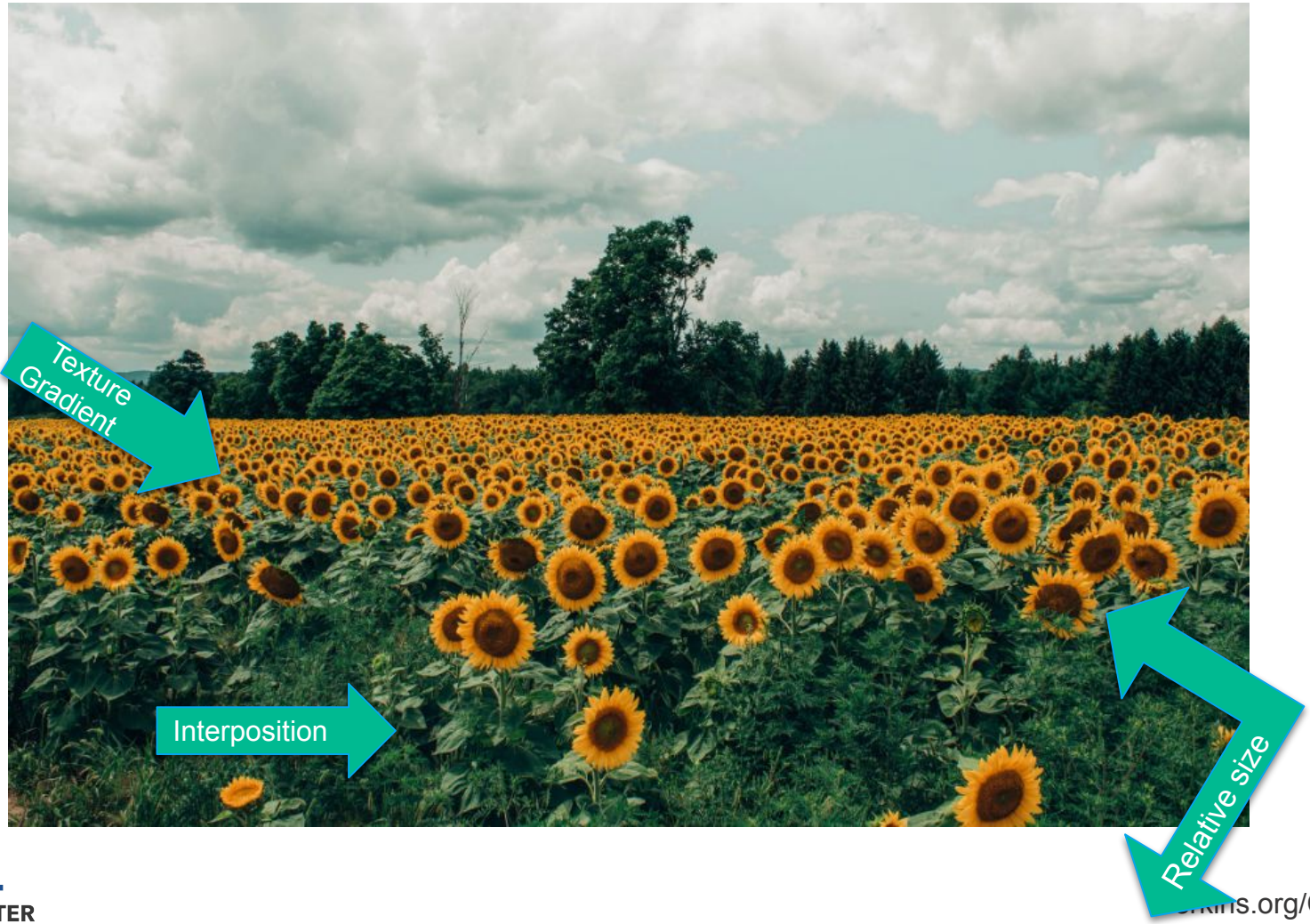
- This assessment area evaluates visual motor skills in relation to foot-eye coordination.

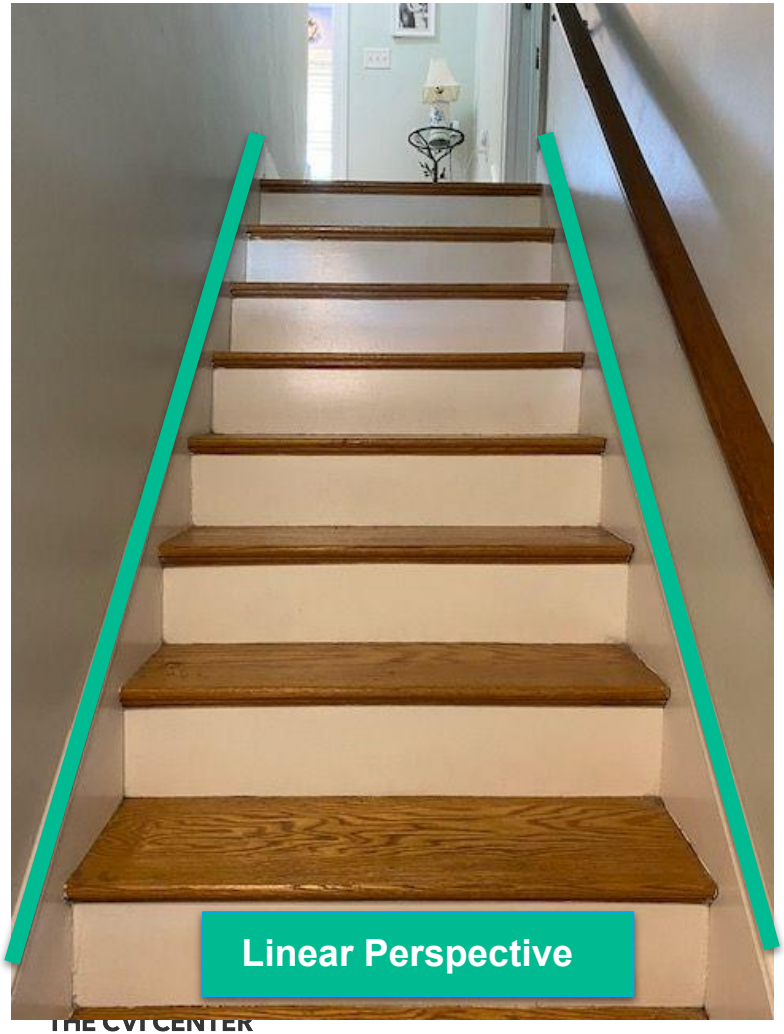
# Depth Perception

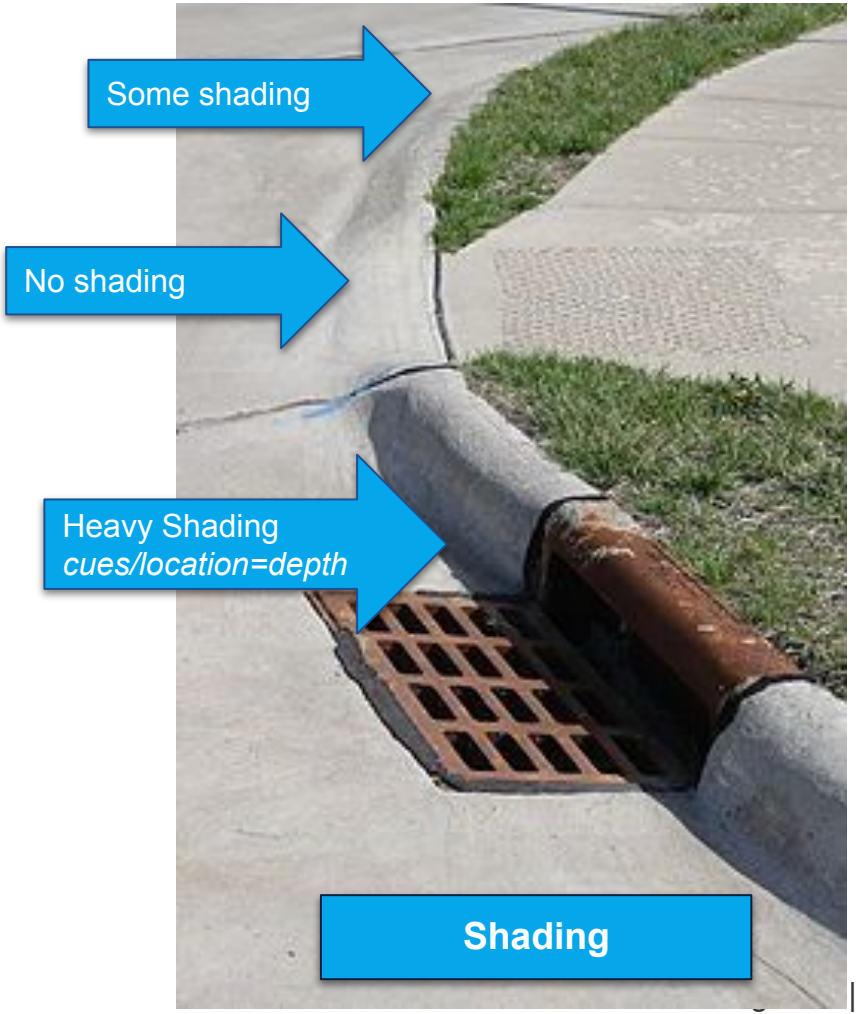
## Monocular Cues

- Linear Perspective (parallel lines converge as they travel away from us)
- Relative Size (things closer to us appear bigger)
- Texture Gradient (seeing textures more clearly when close to us)
- Interposition (if something blocks the view of another object, it's closer)
- Shading (the way shadows fall tell us how close things are to us-stairs)

(PsychExamReview, 2017)


Texture Gradient
Interposition
Relative size






Digital Image: Wiktionary, n.d

# Visual Guidance of UL & LL

- We use many different cues to let us know where something is in space and what we need to do to respond to it or interact with it.
- Our ventral and dorsal streams work together to attend to an object, identify its properties, and respond accordingly with our body.
    - Size, motion, & depth relations
- Damage to the parietal and occipital lobes can lead to difficulty with spatial awareness and spatial relationships.

**Students with CVI:**

- May over-reach or under-reach/ over or under step.
- May demonstrate inappropriate handshape when reaching for a target.
- Knock things over often or reach without looking.
- Pause or drop at changes of threshold.
- Difficulty orienting objects correctly.
- May misreach based on where the object is in their visual field.
- Have reduced accuracy depending on light levels and clutter.
- Demonstrate difficulty judging and responding to the movement of object and/or people/

# Optic Ataxia

- Optic Ataxia results in difficulty completing visually guided tasks. This impacts the ability to judge distance, depth, and weight, which is needed for motor action.

- Object constancies impact visual guidance of goal-directed actions:
  - When reaching out to pick up an object, the hand's in-flight opening correlates with the size of the goal object.
  - Computing object distance is crucial for size constancy and grasp aperture scaling

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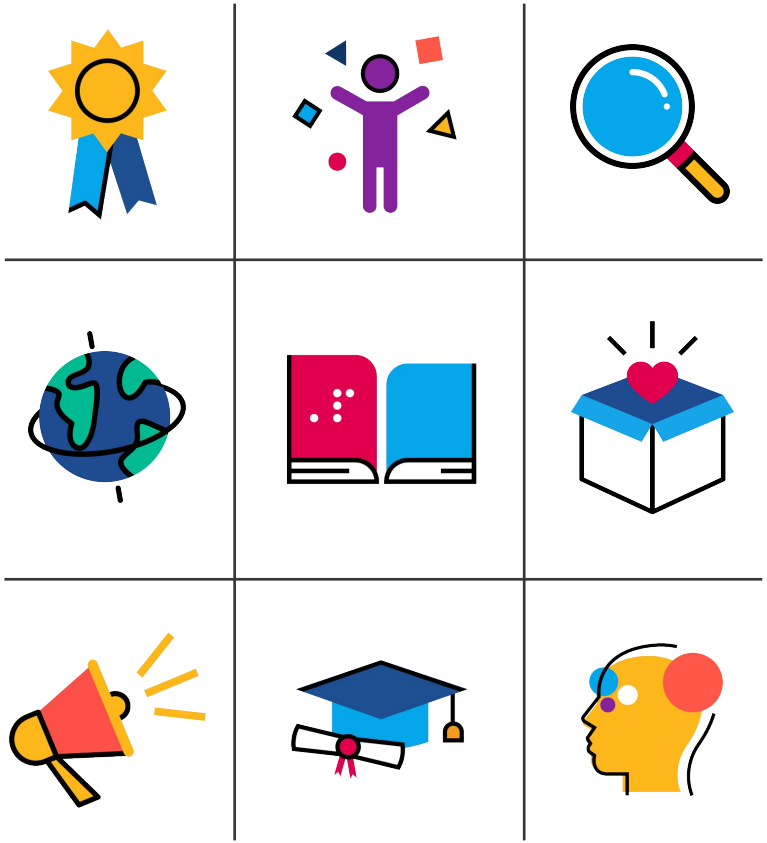
# Impact of Motion



# Impact of Motion

## Perkins CVI Protocol

- This assessment area evaluates the impact of movement in establishing and maintaining visual attention and in supporting visual recognition. Over-attention to movement (inability to disengage) is evaluated in addition to challenges with motion perception (speed, direction, distance).

→ Linked to all areas of assessment/visual behaviors. Special attention to Sensory Integration and Impact on Vision, Impact of Clutter, Visual Guidance of Upper/Lower Limbs

# Impact of Motion

## Impact on Navigation

- “Movement is hard so just getting around is something to think about it. For me to be processing these things means that I can be slowed down in all my other processes while I navigate, which can be quite dangerous.”
- “I can’t see cars moving. I see them first here (motions on elbow) and then they’ll be here next time I see them (motions on middle of her arm) so it’s hard for me to make decisions about where they are. Sometimes when I think they’re one place, then suddenly they’re at the next place and it’s very scary for me.”

# Impact of Motion

## What we know

- “On average, individuals with CVI require nearly three times the motion coherence signals in order to reliably detect the direction of movement of the optic flow stimulus.” Pamir, Z. et al (2021).

- “Children with CVI may manifest motion perception deficits attributed to dorsal stream dysfunction, including abnormalities in detection of optic flow and global or biologically relevant motion, as well as visuomotor integration deficits leading to optic ataxia” - Atkinson (2017)

- Anecdotally, individuals with CVI may be more likely to alert to movement. There may be an inability to visually disengage.

- **Not all** students with CVI need or prefer movement.

# Depth Perception

## Monocular (Motion Based) Cues

- Motion Parallax (things appear to move at different speeds based on distance).

- Optic Flow (the way things move on our retina tells the distance, also incorporating relative size).

(PsychExamReview, 2017)

# Motion Parallax

(Video Media: View from a Train, 2015:https://www.youtube.com/watch?v=3-MqzjceE9 )

# Optic Flow

- As a ball is thrown toward you it expands in all directions equally, the rate of growth on your retina tells you how far away it is.
- When the ball is far away, it's not growing as much. As it gets closer, it's getting very large and growing fast.

(Ball Throw: https://www.youtube.com/shorts/RbBsA3mfpRc)

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# More on Motion Perception

**Interesting facts:**

- When we move in the same direction as something else that is moving, it appears to be moving more slowly. We easily see clearly.

- When we stand still and things are moving around us, seeing them becomes harder.

- When we are moving in the opposite direction to other things that are moving, seeing them is the most difficult.

# Impact of Motion

- Visual mapping of movement occurs in the middle temporal lobe.
- Our brains automatically processes visual information with unconscious evaluation of motion and related cues (optic flow, motion parallax etc). This includes speed, direction, and relevance to self.

**Students with CVI:**

- May pull back or respond adversely to swiftly approaching objects or people (“looming”) (Access to People).
- Many individuals with CVI experience dyskinetopsia (movement is processed more slowly).
- Difficulty judging direction, speed, and an object’s relation to self (distance).
- Avoid crowded areas and dislike environments with unpredictable movement patterns (Sensory Integration, Impact of Clutter).
- May alert to movement but not be able to interpret it.
- Be distracted by movement around them or overly attentive to movement-based toys.

# Dyskinetopsia

**With Dr. Gordon Dutton**

https://vimeo.com/392272832

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(Dyskinetopsia- CVIScotland, 2022)

# Aidan talks about movement

# The Blind Woman Who Saw Rain

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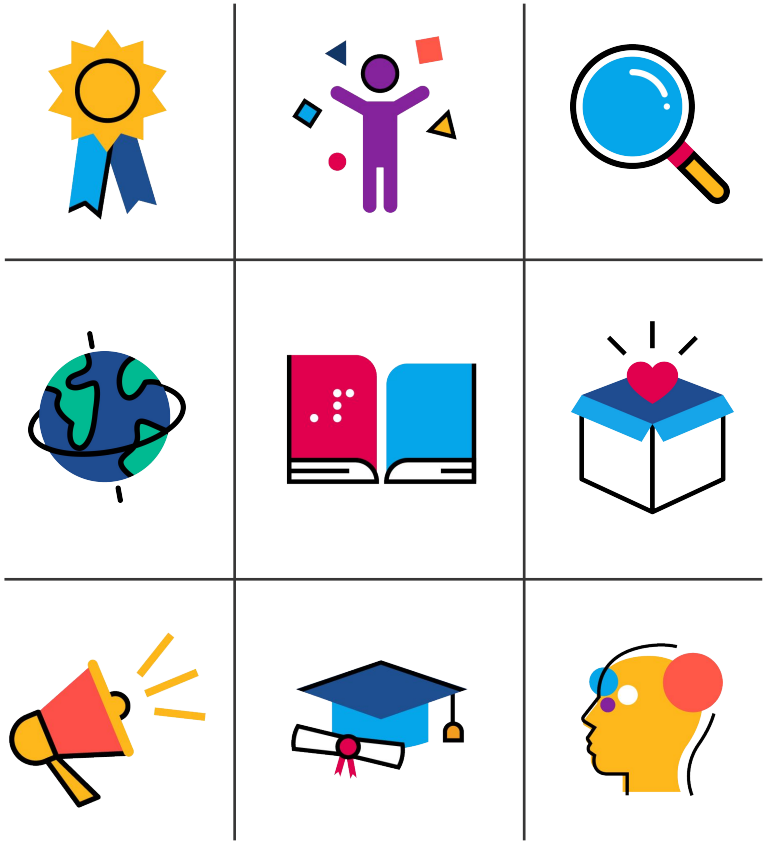
# Access to People



# Access to People

## Perkins CVI Protocol

- This assessment area looks at a student's visual behavior surrounding attention to faces, facial recognition, and interpretation of facial expressions and body language. Additional points of observation relate to the impact of crowding.

→ Linked to all areas of assessment/visual behaviors. Special attention to Impact of Motion, Form Accessibility, Sensory Integration.

# Access to People

## Perceptual Constancy

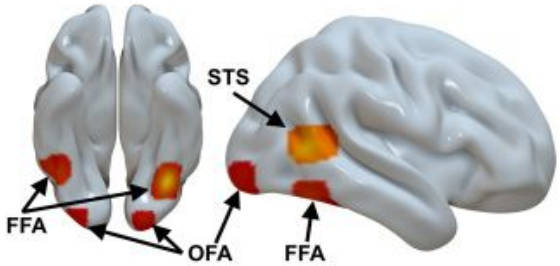
- We can identify someone's face even
  - we're looking at them from a different angle
  - their facial hair has changed
  - they have a different facial expression
  - the lighting in the room is altered
  - we see them in a photograph.

# Prosopagnosia

**(face blindness or facial agnosia)**

- Prosopagnosia is a neurological disorder characterized by the inability to recognize faces.

- Prosopagnosia from occipitotemporal damage is associated with right or bilateral loss of the fusiform and/or occipital face areas (Barton et al, 2021).

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# Prosopagnosia

## Facial Recognition and Implications

- Face perception plays a crucial role in human social interaction.
  - We use face information to assess the identity and emotional state of a person within fractions of a second.
  - We can differentiate and recognize a vast number of individuals with seeming ease.

- Impaired perception of faces can be accompanied by impaired biological-motion perception (Lange et al, 2009).

# Prosopagnosia

https://youtu.be/3-MzNPcEh6M

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# Biological Motion

**What is it?**

- Biological motion describes the movement of human (or animal) bodies or its parts.
- By evaluating the movement of others we are able to identify affective states and intentions.
- Biological motion can involve hand, eye, lip, or whole-body movements, which, together with faces, constitute crucial ingredients of social cognition and interaction.
- Research has indicated a close relationship of face and biological-motion perception in healthy adults (Lange et al, 2009)

# Access to People

- “I can’t see pedestrians moving. I’m quite likely to bump into them. Or suddenly there’s a person in my face and I’m still walking and I have no idea what to do to avoid them, so it can be very stressful to even just walk along a sidewalk.”
- “I know mirrors work on logic, and that’s how I know it’s me when I look in a mirror.”
- One student described the following lego image as “a wonderful example of how I see and remember people. I can see everything about them, except their faces.  When I’m at a party, I’ll see people but I won’t see their faces so it’s very hard for me to see who they are.”

# Access to People

**Facial recognition occurs in the:**

- Fusiform Face Area (FFA), located in the inferior temporal cortex: higher-level manner (i.e. identity)
- Occipital face area (OFA): structural processing of faces.
- Superior temporal sulcus (STS): processes changeable aspects of faces (such as facial expressions, direction of eye–gaze, expression, lip movements, or lip-reading.

**Students with CVI:**

- Difficulty establishing and maintaining eye contact.
- May rely on voice, clothing, context for recognition.
- May have no difficulty with facial recognition.
- May misidentify people based on visual similarities (hair style, color, clothing etc.).
- Use adaptive strategies, such as prompting another person to speak.
- Demonstrate social anxiety.
- Benefit from verbal cues paired with gestures (“high-five!”)

# Facial Recognition, Biological Motion, Optic Flow

(iStock, 2022)

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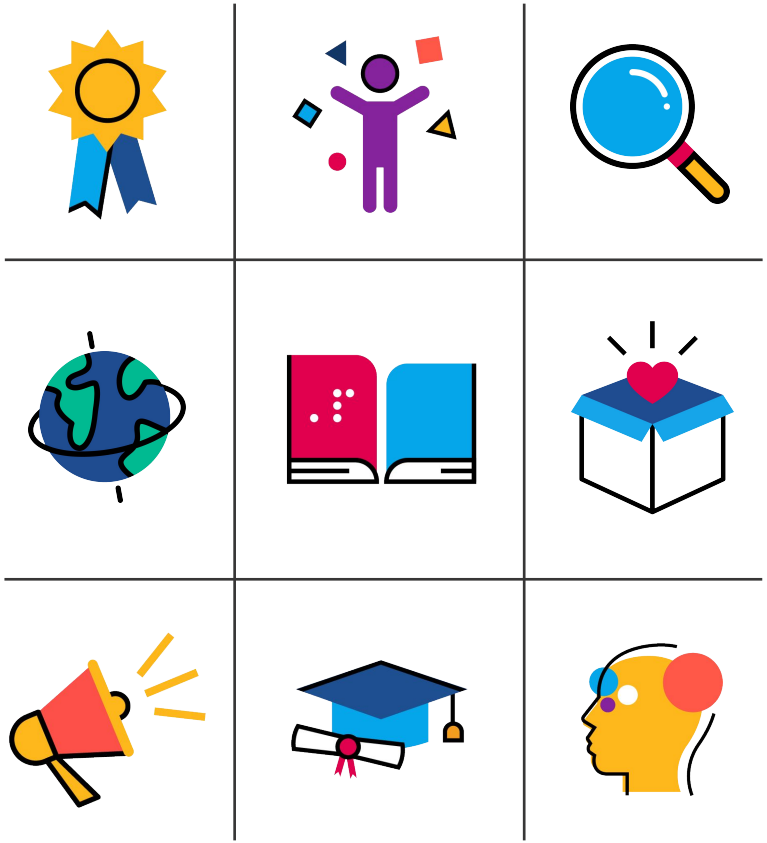
# Form Accessibility

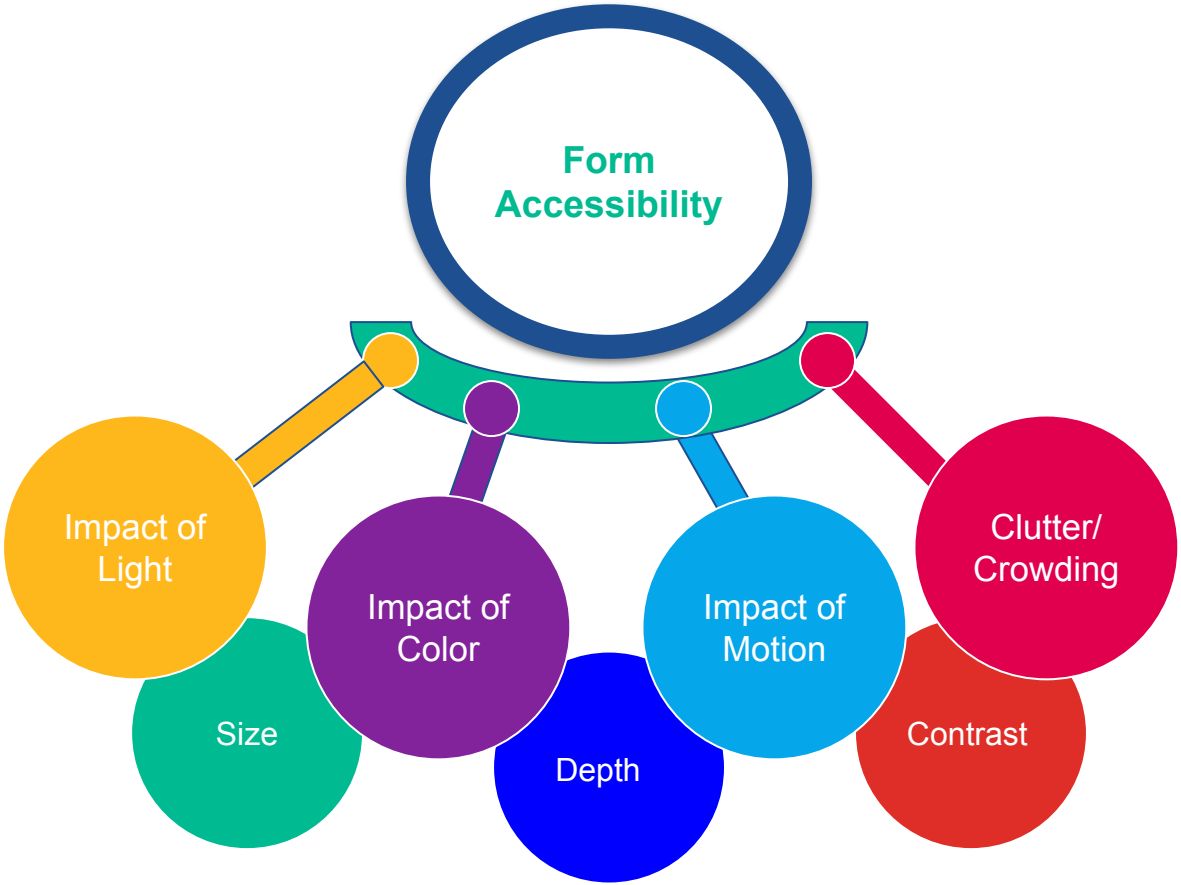


# Form Accessibility

## Perkins CVI Protocol

- This assessment area evaluates optimal and accessible media form based on their visual abilities (i.e. attention, recognition). Assessment includes evaluation of the visual accessibility of multicolored materials vs. solid colored materials, attention to and recognition of two dimensional and three dimensional materials.
  - What visual form is accessible under which conditions?
  - What non-visual access is required for comprehension and learning?
- An LMA is **always** alongside a CVI Assessment.

# **Learned** sensory experiences

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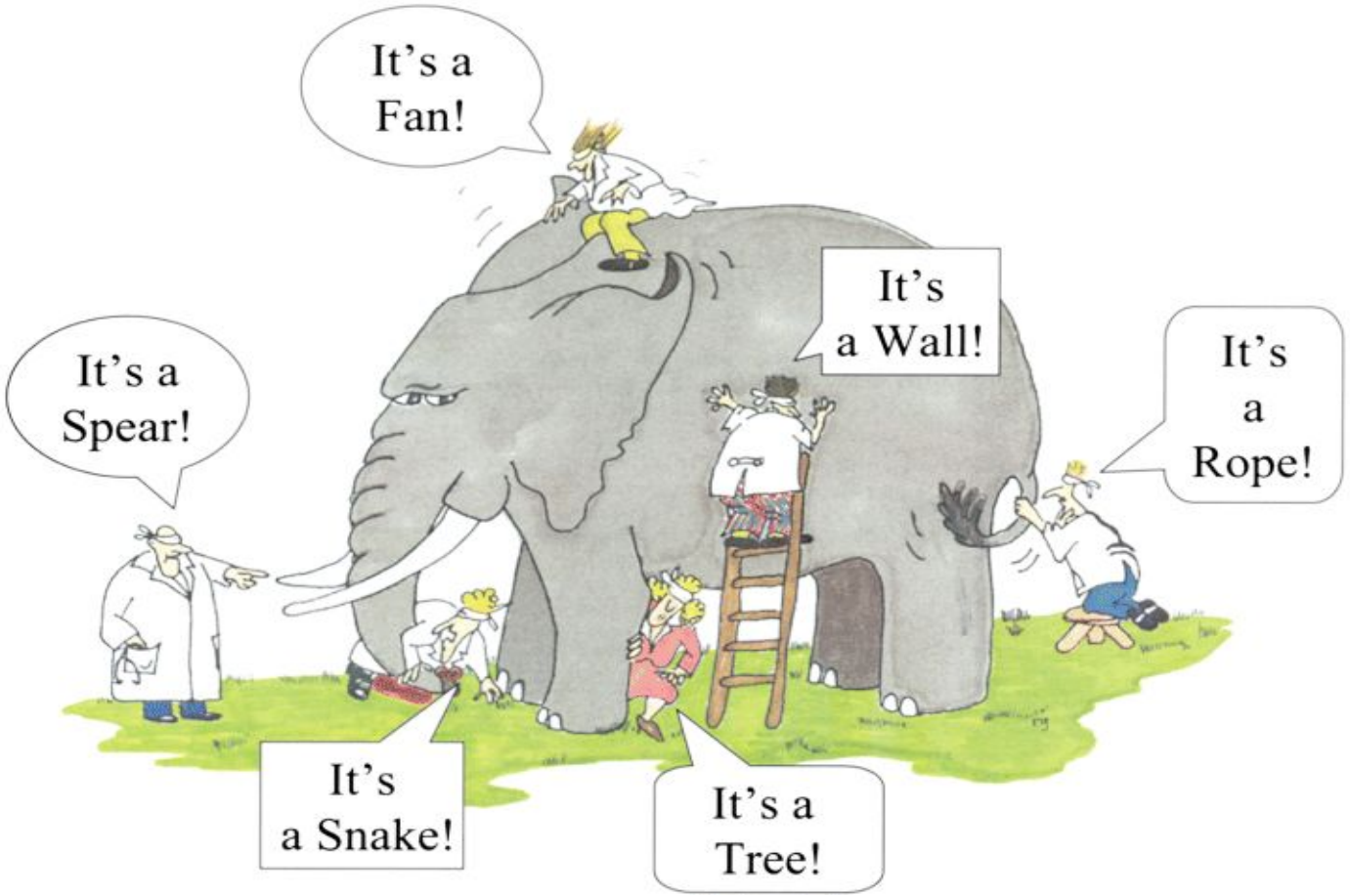
It's a Fan!
It's a Spear!
It's a Wall!
It's a Rope!
It's a Snake!
It's a Tree!

# Form Accessibility

## Perceptual Constancy

*Knowing what something is despite:*

- Changes of viewpoint/shape
- Variability caused by movement
- Changes in size
- New positioning
- Changes in illumination
- Variations in color
- Differences in textures

**Students with CVI:**

- May have difficulty with abstract form.
- Difficulty with 2D (objects, scenes, people)
- May recognize many abstract forms, but experience fatigue with less accessible formats.
- Can identify their cup in one position, but not if on it's side.
- Rely on comparative size for identification (Visual Curiosity).
- Rely on color assumption (Impact of Color).
- Benefit from multisensory access for concepts and recognition (Visual Curiosity).
- Only see one part of an object (Impact of Clutter).
- Rely on context and additional cues (Compensatory).

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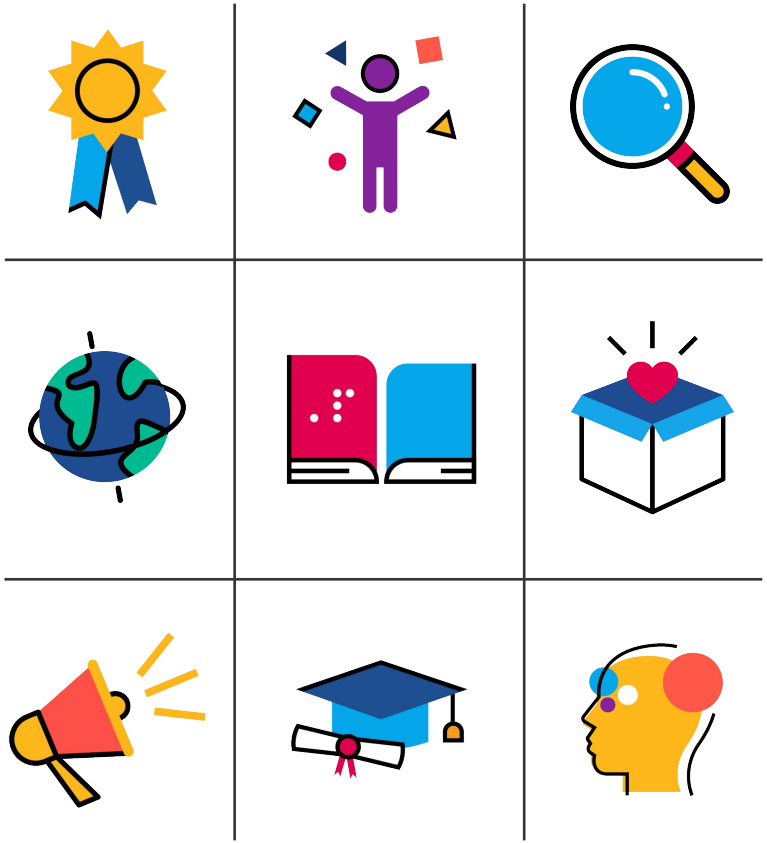
# Response Interval



# Response Interval

## Perkins CVI Protocol

- This assessment area evaluates the length of time it takes a student to become visually aware of a target, establish visual attention, process, and recognize that target. Response intervals are measured using a variety of materials across environments.

→ Linked to all areas of assessment/visual behaviors

# Response Interval

## What we know

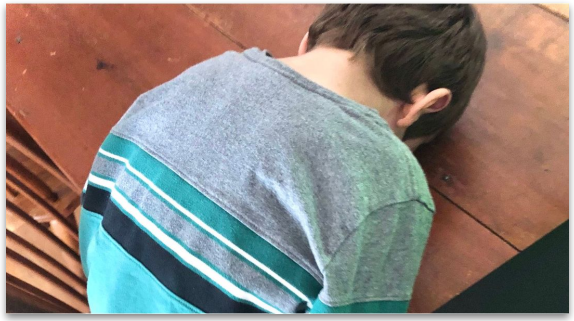
- Set Size Limit: “There is a perceptual limit in terms of how much information the visual brain can handle in a given situation or moment. In fact, this upper limit may be lower in the case of CVI, or show more variability depending on the nature of the task demands.” (Merabet, 2020).

- “It seems that the frontal cortex has to work harder to make up for the fact that early visual areas are not doing their part, so to speak, in visual processing. And this may be related to why kids with CVI are so much more fatigued with increased attention demands.” (Merabet, 2021)

- Response interval is a direct result of the activity, environment/situations, and/or internal state of the individual

# Visual Fatigue

The frontal cortex has to take on the load and work harder. And because the frontal cortex is also interconnected with many other areas in the brain, including attention and emotion, things can break down easily with excessive fatigue.” (Merabet, 2021)



# Response Interval

**Students with CVI:**

- May take longer to visually attend, recognize, and/or respond to stimuli.
- May be aware of a target, but never attend.
- Have increased delays depending on field accessibility.
- Have processing time that fluctuates depending on the environment, internal state, or task at hand.
- Require hands-on, multisensory learning to increase processing and understanding.
- May demonstrate behavior to indicate visual fatigue: crying, escape, non-compliance, head down etc.

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# TeachCVI Screenings

## Introduction & Assignment

# TeachCVI

- A partnership that aims to create collaborative tools for teachers and health care professionals.
- **Dr. Els Ortibus**, pediatric neurologist and rehabilitation physician in Belgium
  - Creation of three screening lists (Level 1, Level 2, Level 3)
  - Screening tools, **not diagnostic**
- Used in Perkins Low Vision Clinic to gather information on student's use of functional vision to aid history intake and suspicion of CVI.
- Used by Perkins CVI Center Team as an interactive interview tool to gain additional information.


TeachCVI.net

# CVI Diagnosis

Eye exam is unremarkable or vision function does not explain how the learners uses their vision.

- Might be history of impact to the brain.

Shows distinct visual behaviors of brain based visual impairment.

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# Aims of the Project
## (TEACH CVI WEBSITE)

- Making a tool for health care professionals and educators to screen for CVI.
- Creating a common database of tools for CVI detection.
- Producing resources for teachers to support their work in the assessment of CVI.
- Making teaching methodologies to enable the child's access to literacy, this includes training and teaching materials for teachers/educators of children with cerebral visual impairment.

# Mission
## (TEACH CVI WEBSITE)

**“TEACH CVI is a partnership that aims to create collaborative tools for teachers and health care professionals. It is meant to build a bridge between teachers/educators and health care professionals so they can work together to benefit the target group: children with Cerebral Visual Impairment (CVI).”**

The National Institute for the Blind, Visually Impaired and Deafblind, Iceland

Katholieke Universiteit Leuven, Belgium

Child Vision, Ireland

State Diagnostic and Counselling Centre, Iceland

Positive Eye Ltd., United Kingdom

The Royal Blind, Scotland

Agency for Special Needs Education and Schools, Sweden

# CVI Screening Benefits

- Medical: Can gather information to support a diagnosis in the context of greater clinical information.
- Educational: Adds to your knowledge of functional vision
- Easy to use
- Being researched by multiple researchers for validity and reliability.

# Screening Levels

- **Screening list CVI 1:**
  - Children with a motor disability who are non-ambulant.
- **Screening list CVI 2:**
  - Children with a developmental age between two and six years old.
- **Screening list CVI 3:**
  - Children with a developmental age between six and twelve years old.

# Forms

***Standard form:*** Parent or teacher fills in the un-bolded version of the screening.

***Bolded forms:*** for scoring

TEACH ERAVS MUSI+

Screening list CVI 1

**For each question, circle the number that applies to your child**

Below there is a list of questions that screen for Cerebral Visual Impairment (CVI).

Circle the number that is the most applicable to the child. Please do so for each question and trust your instinct.

The numbers correspond to:

**1 = Never** **2 = Occasionally** **3 = Frequently** **4 = Always**

| | | | | |
|---|---|---|---|---|
| 1. Makes eye contact. | 1 | 2 | 3 | 4 |
| 2. Has difficulties with looking at objects. | 1 | 2 | 3 | 4 |
| 3. Has difficulties with looking at people. | 1 | 2 | 3 | 4 |
| 4. Stares at light sources (e.g. lights or windows). | 1 | 2 | 3 | 4 |
| 5. Notices objects positioned at waist level or below. | 1 | 2 | 3 | 4 |
| 6. Use of vision can fluctuate. | 1 | 2 | 3 | 4 |
| 7. Smiles in response to you smiling at him/her. | 1 | 2 | 3 | 4 |
| 8. Recognizes familiar people only when they speak. | 1 | 2 | 3 | 4 |

**1 = Never** **2 = Occasionally** **3 = Frequently** **4 = Always**

| | | | | |
|---|---|---|---|---|
| 1. Makes eye contact. | **1** | **2** | 3 | 4 |
| 2. Has difficulties with looking at objects. | 1 | 2 | **3** | **4** |
| 3. Has difficulties with looking at people. | 1 | 2 | **3** | **4** |
| 4. Stares at light sources (e.g. lights or windows). | 1 | 2 | **3** | **4** |
| 5. Notices objects positioned at waist level or below. | **1** | **2** | 3 | 4 |
| **6. Use of vision can fluctuate.** | 1 | 2 | **3** | **4** |
| 7. Smiles in response to you smiling at him/her. | **1** | **2** | 3 | 4 |
| 8. Recognizes familiar persons only when they speak. | 1 | 2 | **3** | **4** |

## Screening

## Scoring sheet

*Bold likert: positive answer*

*Bold question: screener*

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# Screening list for children with a suspicion of Cerebral Visual Impairment (CVI)

## 1) General information

Date questionnaire filled in: .....

Filled in by (name): .....

Relation to the child:

- ❑ Parent
- ❑ Teacher
- ❑ Health care professional
- ❑ Other interested person (please specify: .....)

## 2) Information about the child

Name: .....

Date of birth: ..... Age: .....y.....m

Gender:

- ❑ Male
- ❑ Female
- ❑ Other

# Background Information

- Person's name who is completing the form
- Name, date of birth and gender of the child
- Pregnancy and birth history: duration, difficulties, birth weight, head circumference, multiple birth
- Delivery: vaginal, caesarian, assisted
- Medical issues
- Developmental issues
- Therapies
- Medications
- Visual problems: Glasses?

# Screening Details & Criteria

| Level | Number of Questions | Number of Screeners | Criteria for Positive Screening |
|---|---|---|---|
| 1 | 19 | 6 | • 3/6 screeners with or without additional marked items<br>• OR 6 or more items marked |
| 2 | 35 | 8 | • 4/8 screeners with or without additional marked items<br>• OR 11 or more items marked |
| 3 | 45 | 8 | • 4/8 screeners are indicated with or without additional marked items<br>• OR 15 or more items are marked |

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# Does not account for Deaf or HOH

16. Closes his/her eyes when listening to voices or sounds.

18. Reacts adversely to traffic sounds or suddenly produced sounds.

**19. Reacts to sound rather than to visual stimuli.**

Documenting findings *example*:

- Level 2 has 35 questions
- 14/32 questions answered were positive for CVI. 7/7 screeners answered were positive for CVI.

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# TEACH CVI: Visual Behaviors

- Eye contact and facial recognition
- Visual attention
- Reaction to motion
- Visual motor: Eye/ hand and Eye/foot
- Reaction to clutter/crowding
- Impact of Color
- Visual field use
- Fatigue
- Visual recognition
- Difficulties with reading and writing

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# TEACH CVI: Visual Behaviors

- Difficulties handling sound while using visual skills
- Difficulties in new places, with new people and with new materials.
- Reactions to fast movement
- Difficulties with symbol forms: photographs, line drawing in Black and white vs. color
- Behaviors and anxiety
- Difficulties seeing details
- Difficulty seeing object far away.
- Difficulty judging motion
- Supporting vision use with compensatory skills

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# Caretaker Form: Example Level 2

The numbers correspond to:

**1 = Never** **2 = Occasionally** **3 = Frequently** **4 = Always**

| | | | | |
|---|---|---|---|---|
| 1. Makes eye contact. | 1 | 2 | 3 | 4 |
| 2. Has difficulties with looking at objects. | 1 | 2 | 3 | 4 |
| 3. Has difficulties with looking at people. | 1 | 2 | 3 | 4 |
| 4. Stares at light sources (e.g. lights or windows). | 1 | 2 | 3 | 4 |
| 5. Notices objects positioned at waist level or below. | 1 | 2 | 3 | 4 |
| 6. Use of vision can fluctuate. | 1 | 2 | 3 | 4 |
| 7. Smiles in response to you smiling at him/her. | 1 | 2 | 3 | 4 |
| 8. Recognizes familiar people only when they speak. | 1 | 2 | 3 | 4 |
| 9. Prefers certain colours over others. | 1 | 2 | 3 | 4 |
| 10. Does not recognise common objects. | 1 | 2 | 3 | 4 |
| 11. Does not recognise common pictures/images. | 1 | 2 | 3 | 4 |
| 12. Can find a favourite toy easily when it is amongst other toys. | 1 | 2 | 3 | 4 |

# Scoring

Information:

The **positive** answers indicative of CVI are numbered and marked in bold.

**“Screeners”** are complete sentences marked in bold indicated in each screening.

Expanded scoring sorts ventral and dorsal indicators.

| 1 = Never | 2 = Occasionally | 3 = Frequently | 4 = Always |
|---|---|---|---|
| 1. Makes eye contact. | | **1** **2** 3 4 | |
| 2. Has difficulties with looking at objects. | | 1 2 **3** **4** | |
| 3. Has difficulties with looking at people. | | 1 2 **3** **4** | |
| 4. Stares at light sources (e.g. lights or windows). | | 1 2 **3** **4** | |
| 5. Notices objects positioned at waist level or below. | | **1** **2** 3 4 | |
| **6. Use of vision can fluctuate.** | | 1 2 **3** **4** | |
| 7. Smiles in response to you smiling at him/her. | | **1** **2** 3 4 | |
| 8. Recognizes familiar persons only when they speak. | | 1 2 **3** **4** | |
| 9. Prefers certain colours over others. | | 1 2 **3** **4** | |
| **10. Does not recognise common objects.** | | 1 2 **3** **4** | |
| 11. Does not recognise common pictures/images. | | 1 2 **3** **4** | |
| **12. Can find a favourite toy easily when it is amongst other toys.** | | **1** **2** 3 4 | |

# To Score:

- Count the number of bolded responses.
- Check whether or not screeners are marked.

# Scoring Screening 1:

- 3 out of 6 screeners (bold sentences)
- 6 or more bold answers: 1/3 of the list (bold numbers)

# Screening 1: 6 Screeners (Bold Sentences)

**Item 6: Use of vision can fluctuate.**

**Item 10: Does not recognise common objects.**

**Item 12: Can find a favourite toy easily when it is amongst other toys.**

**Item 14: Looks away while reaching out for an object.**

**Item 17: Notices an object only when it moves.**

**Item 19: Reacts to sound rather than to visual stimuli.**

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# Scoring Screening 2

- 4 out of 8 screeners (bold sentences)
- 11 or more bold answers: 1/3 of the list (bold numbers)

# Screening 2: 8 screeners (Bold Sentences)

**Item 4: Tilts head to look at something.**

**Item 15: Looks away while reaching out for an object.**

**Item 20: Does not recognise common objects.**

**Item 22: Recognises common objects only when drawn in colour.**

# Screening 2: 8 Screeners (Bold Sentences)

**Item 25: Has difficulties with interpreting more complex drawings (e.g. overview picture/situation picture).**

**Item 26: Can find a favourite toy easily when it is amongst other toys.**

**Item 31: Has difficulty walking down steps.**

**Item 34: Touches an object in preference to looking at it.**

# Scoring Screening 3

- 4 out of 8 screeners (bold sentences)
- 15 or more bold answers: 1/3 of the list (bold numbers)

# Screening 3: 8 Screeners (Bold Sentences)

**Item 4: Tilts head to look at something.**

**Item 15: Looks away while reaching out for an object.**

**Item 22: Does not recognise common objects.**

**Item 27: Can find a favourite toy easily when it is amongst other toys.**

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# Screening 3: 8 screeners (Bold Sentences)

**Item 32: Has difficulties with interpreting more complex drawings (e.g. overview picture/situation picture).**

**Item 33: Has difficulties with following the line when reading.**

**Item 39: Has difficulties walking down steps.**

**Item 43: Has difficulties perceiving the movement of objects (e.g. movement of a car or movement of a ball).**

# TVI Use:

Completed in an interview with parent scoring and for other qualifiers.

Embed answers about child's functional vision into assessment and report

Share evaluation report with medical professional

Might lead to diagnosis BY THE MEDICAL PROFESSIONAL

# Case Study: Screening Level 2

Joseph

| 1 = Never | 2 = Occasionally | 3 = Frequently | 4 = Always |
|---|---|---|---|
| 1. Makes eye contact. | 1 | **2** | 3 | 4 |
| 2. Has difficulties with looking at objects. | 1 | 2 | **3** | 4 |
| 3. Has difficulties with looking at people. | 1 | 2 | **3** | 4 |
| **4. Tilts head to look at something.** | 1 | 2 | **3** | 4 |
| 5. Has difficulties following moving objects (e.g. following a moving car). | 1 | 2 | 3 | **4** |
| 6. Has difficulties following moving people (e.g. following a moving person). | 1 | 2 | 3 | **4** |
| 7. Stares at light sources (e.g. lights or windows). | 1 | **2** | 3 | 4 |
| 8. Falls over clearly visible objects. | 1 | 2 | **3** | 4 |
| 9. Orientates the head downwards when walking. | 1 | 2 | 3 | **4** |
| 10. Easily bumps into things. | 1 | 2 | 3 | **4** |

| | | | | |
|---|---|---|---|---|
| 11. Pays attention only to objects in front of him/her. | 1 | 2 | **3** | 4 |
| 12. Use of vision can fluctuate. | 1 | 2 | **3** | 4 |
| 13. Clutter in the room appears to interfere with visual attention. | 1 | 2 | 3 | **4** |
| 14. Objects need to be brought close to be seen. | 1 | 2 | 3 | **4** |
| **15. Looks away while reaching out for an object.** | 1 | 2 | 3 | **4** |
| 16. Reacts adversely in a strange or unfamiliar environment (e.g. shop or street). | 1 | 2 | **3** | 4 |
| 17. Has difficulties distinguishing familiar from unfamiliar faces. | 1 | 2 | 3 | **4** |
| 18. Reacts adversely to traffic sounds or suddenly produced sounds. | 1 | 2 | **3** | 4 |
| 19. Reacts adversely to, e.g. passing children, cyclists or cars. | 1 | 2 | **3** | 4 |

| | | | | |
|---|---|---|---|---|
| **20. Does not recognise common objects.** | 1 | 2 | 3 | 4 |
| 21. Does not recognise common pictures/images. | 1 | 2 | 3 | 4 |
| **22. Recognises common objects only when drawn in colour.** | 1 | 2 | 3 | 4 |
| 23. Recognises people by their voice, clothes and posture rather than looking at their faces. | 1 | 2 | 3 | 4 |
| 24. Has difficulties when the lay-out of a room/class has changed. | 1 | 2 | 3 | 4 |
| **25. Has difficulties with interpreting more complex drawings (e.g. overview picture/situation picture).** | 1 | 2 | 3 | 4 |
| **26. Can find a favourite toy easily when it is amongst other toys.** | 1 | 2 | 3 | 4 |
| 27. Can find a favourite toy easily when it is on a patterned surface (e.g. a rug or blanket). | 1 | 2 | 3 | 4 |
| 28. Has difficulties distinguishing familiar from unfamiliar faces in a crowd. | 1 | 2 | 3 | 4 |
| 29. Hesitates when there is a change of floor surface (e.g. from a wooden floor to a carpet or when encountering steps). | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| 30. Hesitates where a floor pattern changes (e.g. from black to white tiles). | 1 | 2 | **3** | 4 |
| **31. Has difficulty walking down steps.** | 1 | 2 | **3** | **4** |
| 32. Has difficulty perceiving the movement of objects (e.g. movement of a car or movement of a ball). | 1 | 2 | **3** | **4** |
| 33. Has difficulty perceiving the movement of people. | 1 | 2 | **3** | **4** |
| **34. Touches an object in preference to looking at it.** | 1 | 2 | **3** | 4 |
| 35. The child appears to try to compensate by talking a lot. | 1 | 2 | **3** | 4 |

NA

# Results

***Screener*** Criteria for Level 2: 4 out of 8 positive screener questions

Joseph gets 8 out of 8

***Likert: Answers indicative of CVI:*** Criteria for Level 2: 11+

Joseph gets 33/34 positive answers

# Share Screening Tool with Doctor

- Share screening results
- Teach CVI Brochure for Doctors

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# Outcomes of Screening Use

- Gives medical professional quick “red flags” for CVI
- Sparks medical referral for educational evaluation
- Sets up collaborative system of sharing
- Gathers enough information for diagnosis
- Ensures TVI is on the team
- Provides visual and compensatory access areas for learning

# Results for Joseph:

## Using the TEACH CVI Screening Level 2

- Joseph has a highly positive screen for CVI for both marked screener questions and CVI indicated marked answers.

- **Marked Screeners:** Joseph has 8/8 (Criteria is 4/8 or more for CVI)
- **Marked Answers:** Joseph has 33/34 (2 question not relevant). (Criteria is 11 or more for CVI)

# For January 20th

Teach CVI Screening #3
https://www.teachcvi.net/_files/ugd/eca85c_394f3bbbc63a43728062bf1035977714.pdf

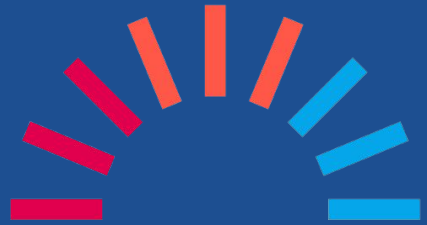
Pick a Visual Behavior

Find 1 TEACH CVI Statement that would fall under that visual behavior umbrella.

Are there overlapping visual behaviors within that statement as well?

Report out at our January 20th session.

Perkins.org



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