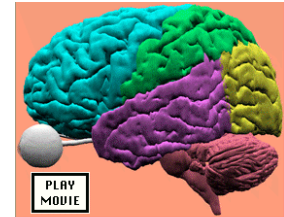


# *Turning the Brain on for Language*



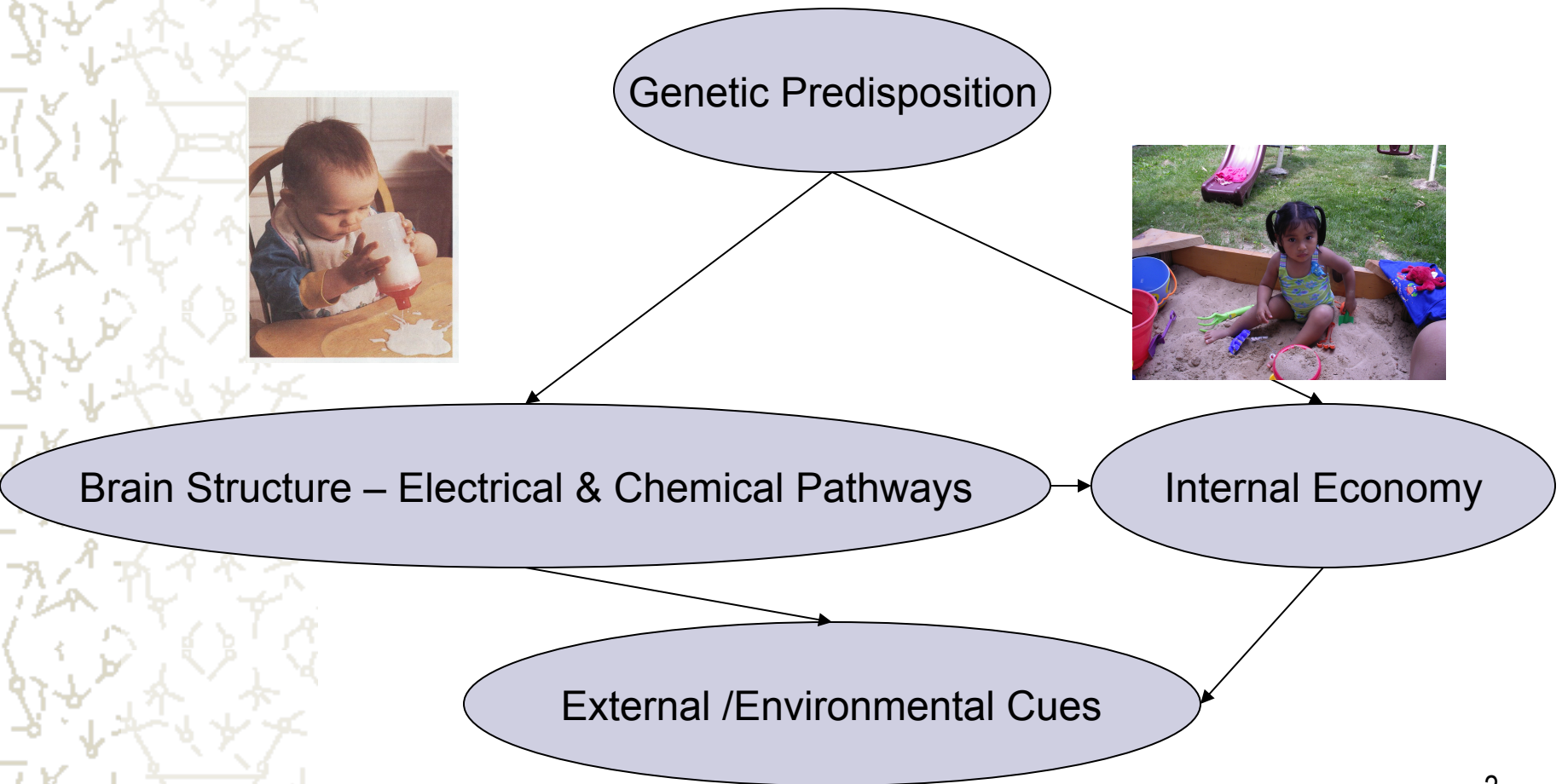
Dr. Valerie Scaramella-Nowinski  
Drina Madden M.A., C.A.S.



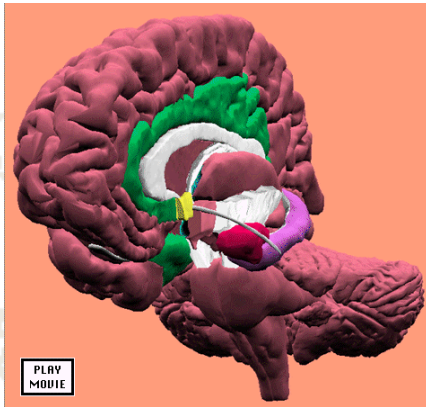
[childhealthlearn.org](http://childhealthlearn.org)  
[ndcbrain.com](http://ndcbrain.com)



# ***DEVELOPMENT depends on:***



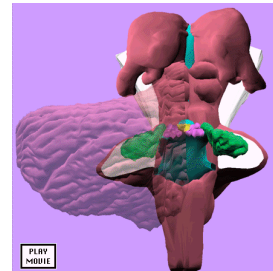
# Systems Biology



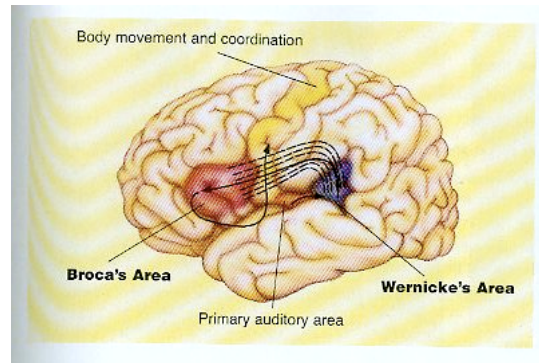
EXECUTIVE FUNCTION/PLANNING

MEMORY

MULTISENSORY  
ATTENTION

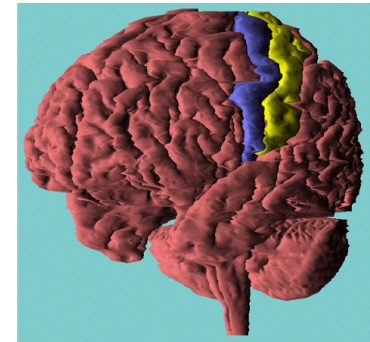


# Systems Biology



**SPEECH/LANGUAGE**

**SENSORY/MOTOR**





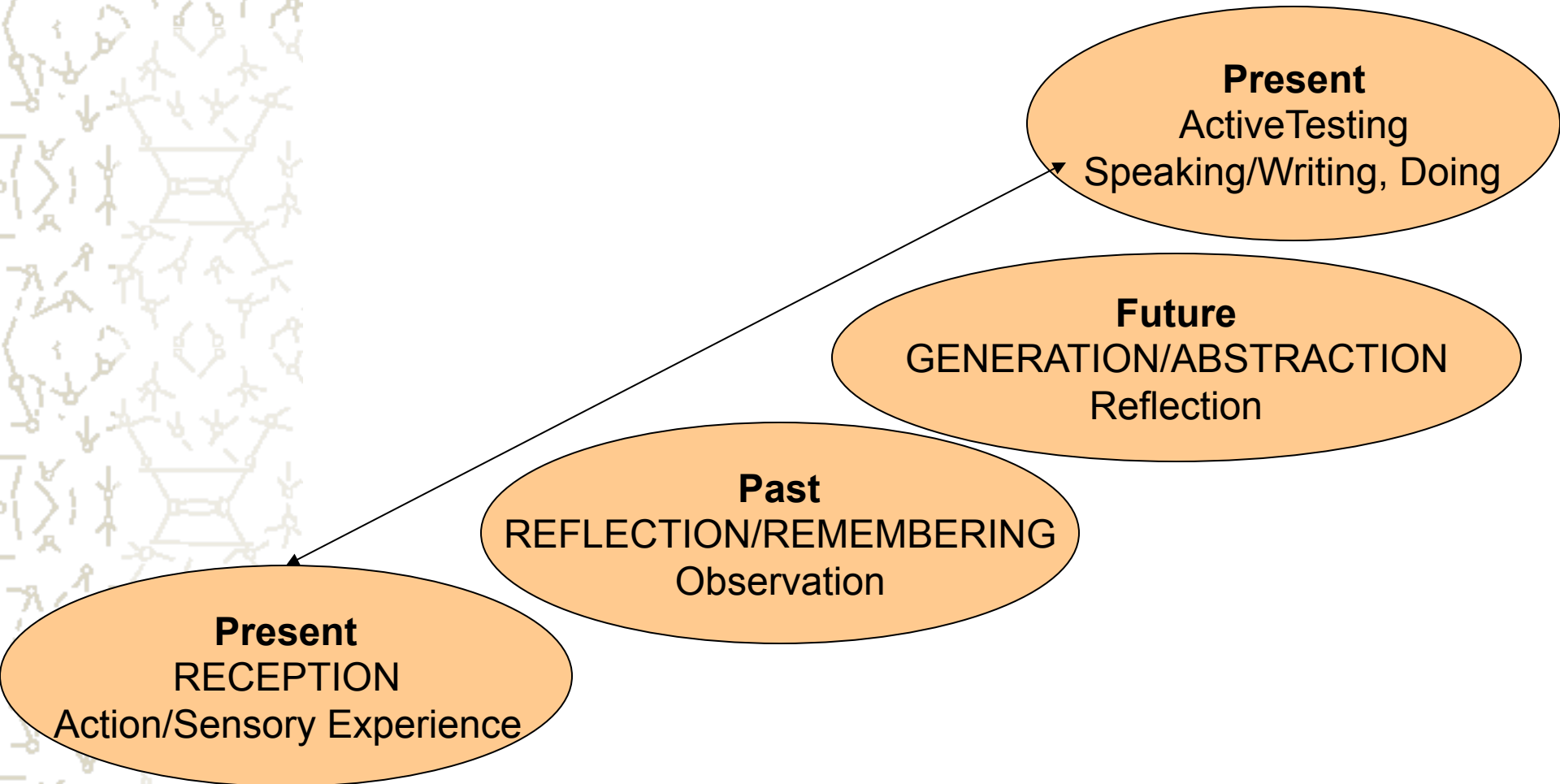
# Systems Biology

## Vygotsky - Basic perceptual, attentional and memory capacities

- Lead to mental representation and efficient thinking
- Become skilled at imitating others



# How People Learn





# Importance of Language

## Vygotsky – Brain is biologically set for language



Research has shown

- Skilled conversationalists - age 2 to 3
- Mastered most grammar - age 6
- 10,000 words - age 6



# Importance of Language

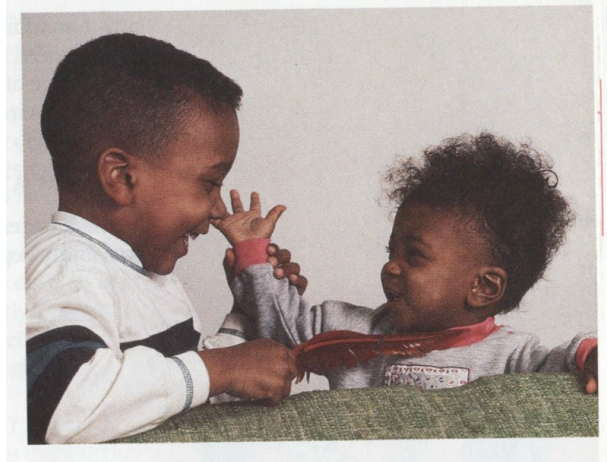
**Language - the most significant milestone in children's cognitive development**





# Importance of Language

**Language - the means for communicating with others and representing our experiences**







# Importance of Language

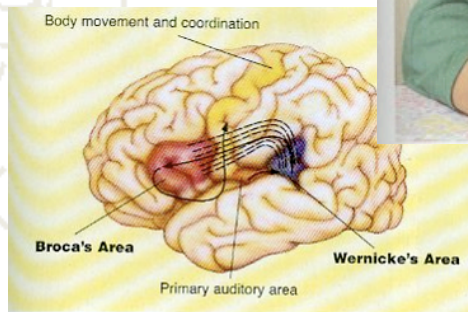
## Language

- allows people to represent objects and events with symbols
- allows development to switch from biology to learning through social context



# Awakening the Language Brain

What makes us **human** is the **complexities** of language



# Importance of Language

**With help, children can perform tasks beyond what they can perform alone**





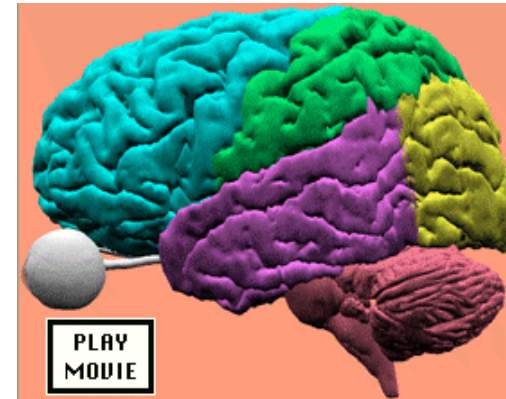
# Awakening the Brain

# Awakening the Brain

**Stronger Brain Pathways**

*lead to*

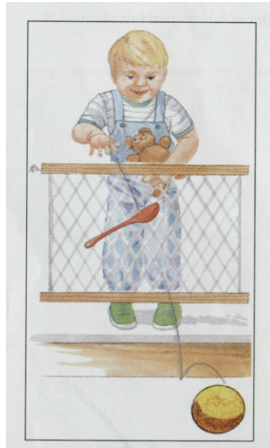
**Development of the Functions  
of Learning**





# Awakening the Brain

***STRONG STIMULUS***  
**= *STRONG***  
***RESPONSE***



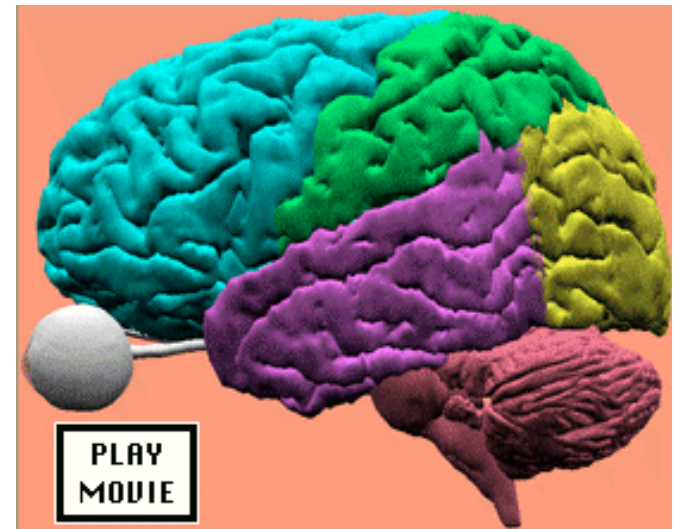
*Weak stimulus = Weak response*



# Awakening the Brain

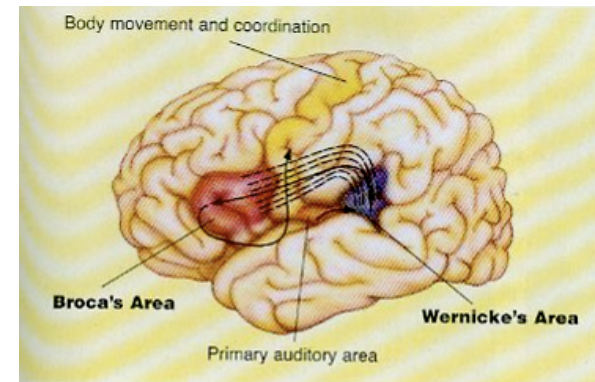
***Better synchrony/timing consolidates multisensory memory***

***This is the Basis of Learning***



# Awakening the Language Brain

As sensory rhythms and reflexes are synchronized (the “in-sync” child) language pathways are being strengthened

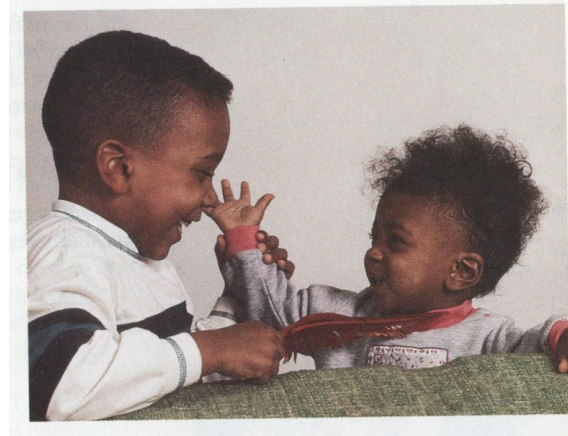


# Awakening the Language Brain

**External speech**

**Becomes**

**Internal speech**



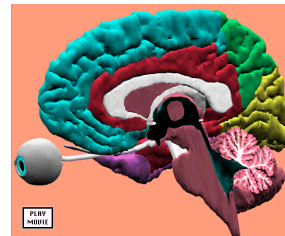
**Which governs self-regulation of  
behavior/executive function**

# The Essential Language/ Reading Brain



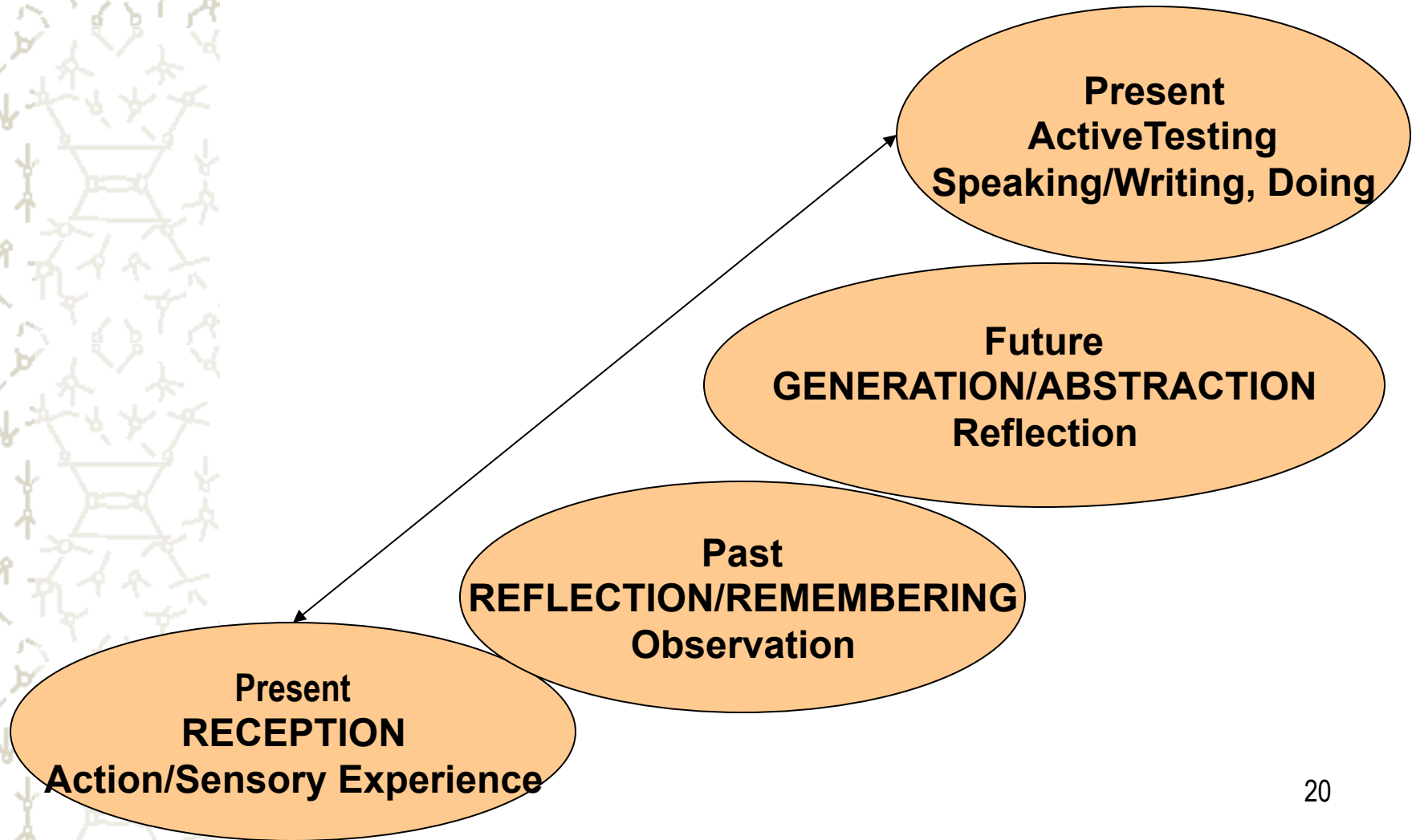
**Turn on the Brain for  
Language/Reading**

**Strengthening Language in the  
Classroom**





# How People Learn



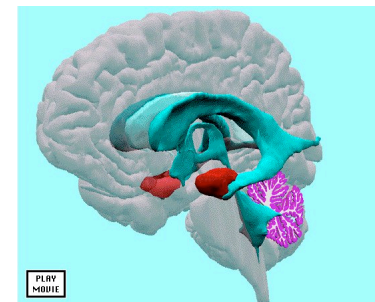
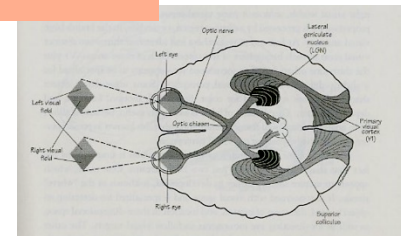
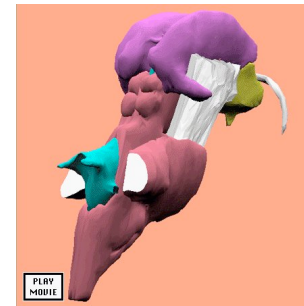
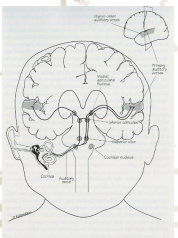
# The Essential Language/Reading Brain

## LANGUAGE DEPENDS UPON

- Ability to pay attention

**Relaxed alertness**

- A well designed visual system
- A well designed auditory system
- A strong sensorimotor system
- A strong memory system
- Ability to execute a plan/organize



# The Essential Language/Reading Brain

Attention to:

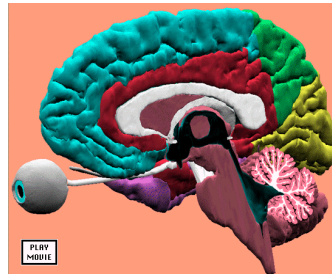
– What you SEE

- Your world
- The squiggles on paper

– This requires the coordination of different brain areas

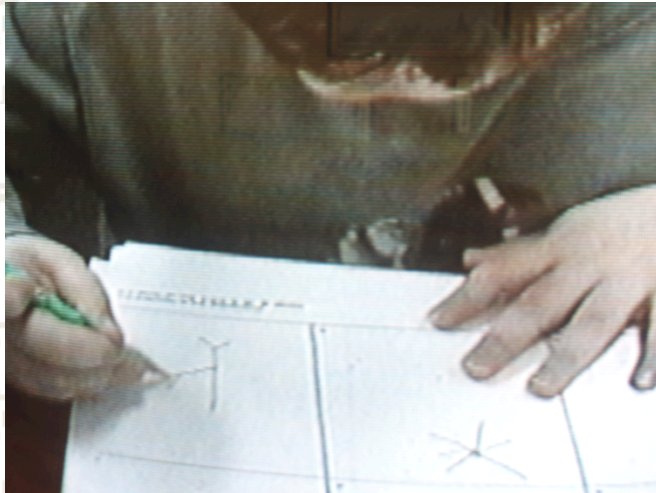


cat



# The Essential Language/Reading Brain

Eyes must focus - together



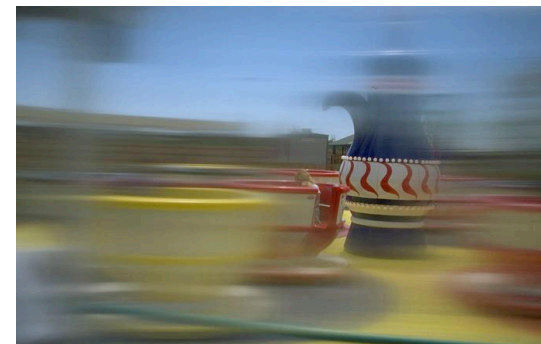
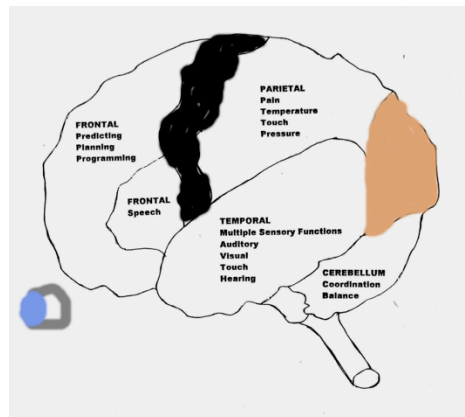


# The Essential Language/Reading Brain

– Eyes must perceive shape and size of symbols

a      B      c      d

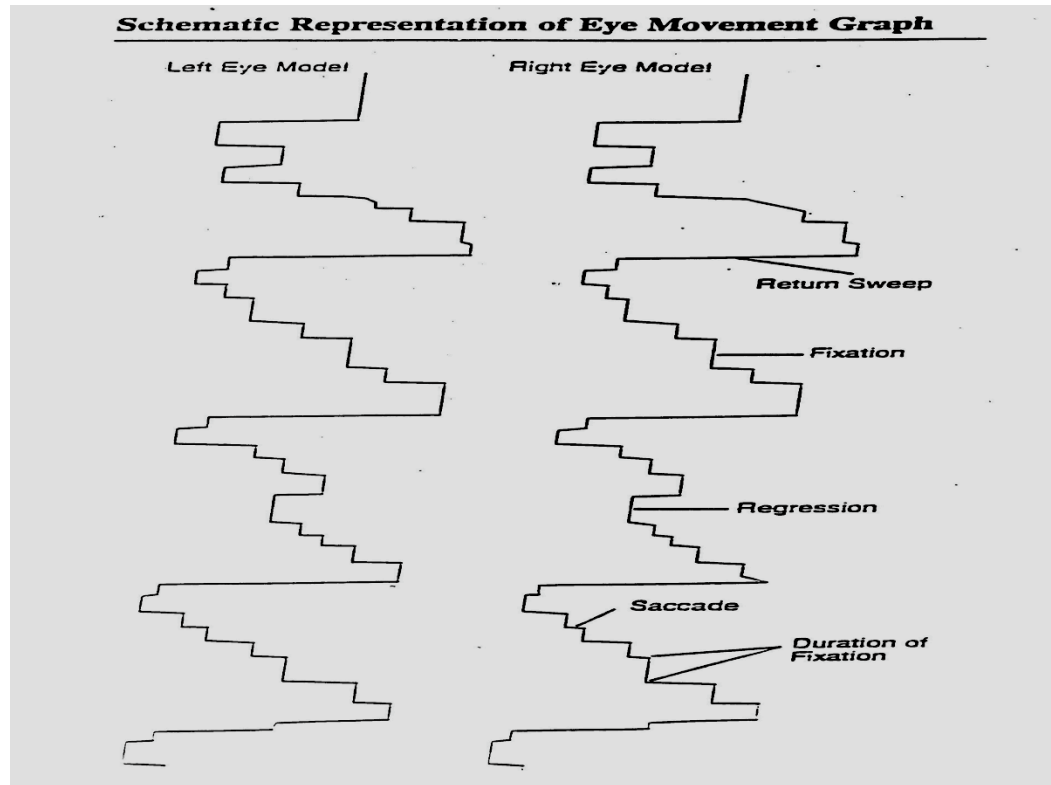
– Eyes must “track” motion





# The Essential Language/Reading Brain

## Coordinated eye movements



# The Essential Language/Reading Brain

## Uncoordinated eye movements

n," said B y. "W i r  
"Comeo ets ehav dicku o n.  
eto qth sc

eqon' not fqdc  
W thave a her cano orn."

"Arew ngt tdo bcor t'sqee n theflo ",as ked Su  
egoi oea ntha no or? san.

"It'seasy. Wec wa Betsyan ed.  
an shit," swer

"Tha goodi Su  
t'sa pea," said san.

# The Essential Language/Reading Brain

Visual brain must notice/perceive symbols

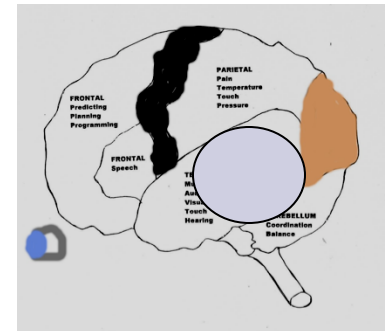
f r o g

Visual experiences must be stored

Memory: retrieval from storage

Output/expression: a complex task

frog



# The Essential Language/Reading Brain

Attention to what you HEAR

- Environment and the People in it
- The individual sounds of the human voice



- **Pitch**

Mary little lamb  
had a

- **Volume**

**Mary had a little lamb**

- **Tone**

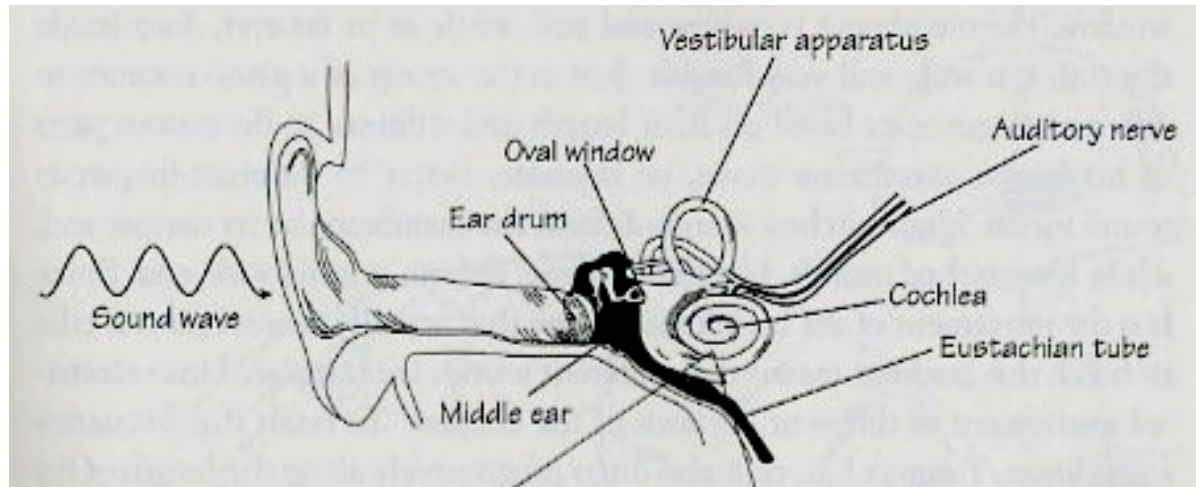
**MARY HAD A LITTLE LAMB**

- **Frequency**

# The Essential Language/Reading Brain

Ears need a clear/clean hearing path

Ears must modulate sounds



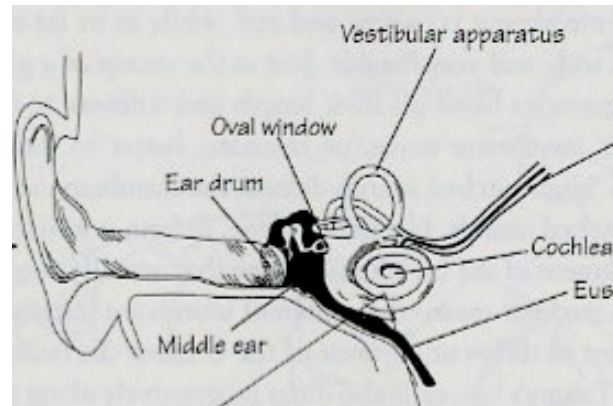


# The Essential Language/Reading Brain

Auditory system must notice/perceive different sounds /p/ /b/

Phonemic awareness (noticing the individual sounds in words) must occur

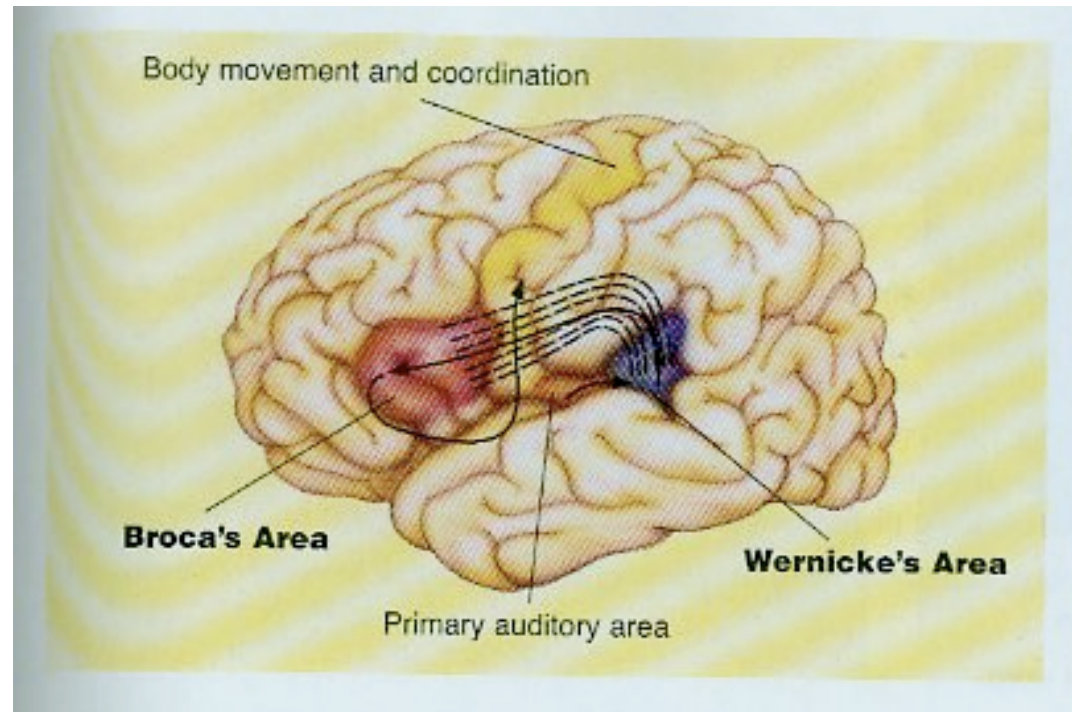
**Cat**



**/c//a//t/**

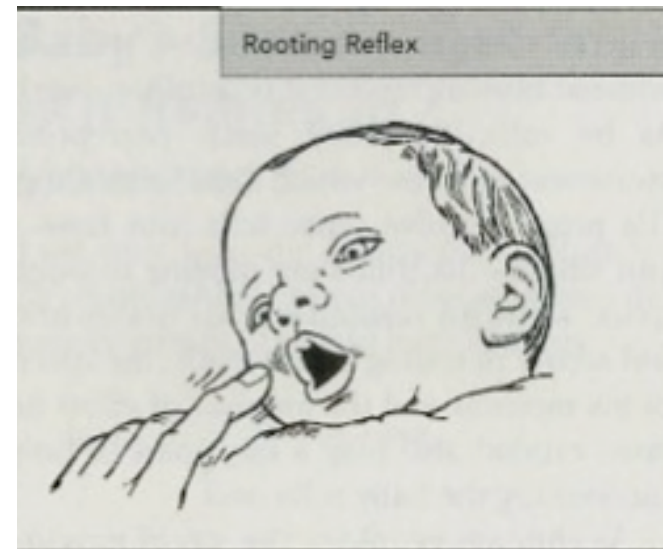
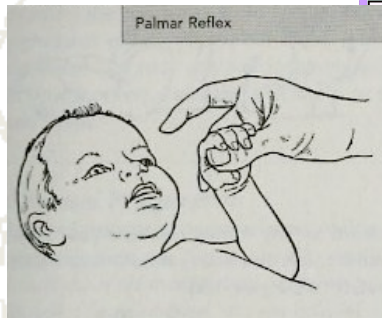
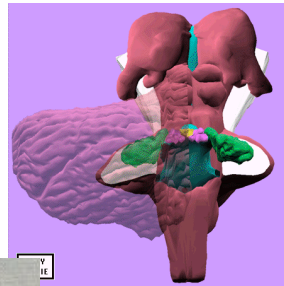
# The Essential Language/Reading Brain

Sounds and experiences must be stored  
Storage must be accessed



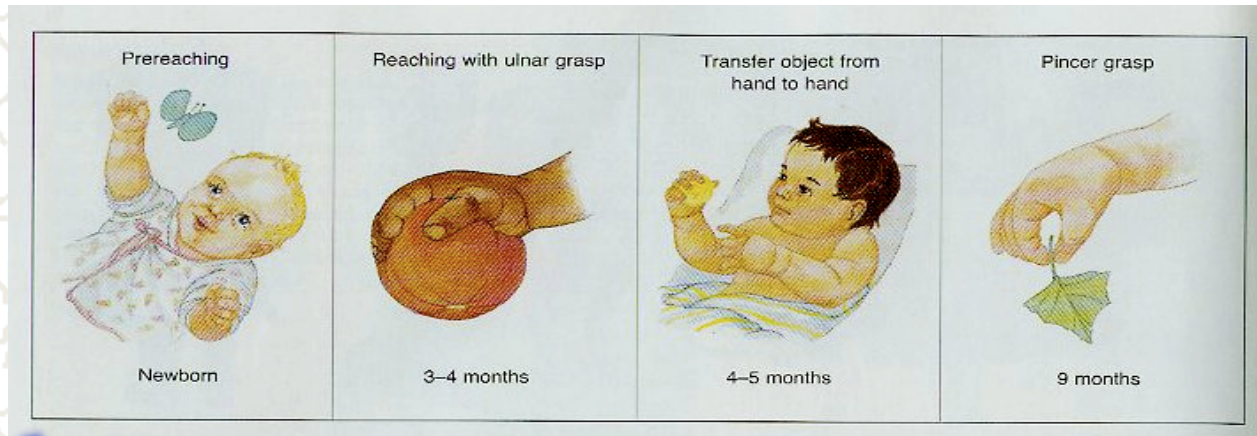
# The Essential Language/Reading Brain

Multisensory Reflexes Begin in Utero to assist survival



# The Essential Language/Reading Brain

## Sensorimotor reflex development

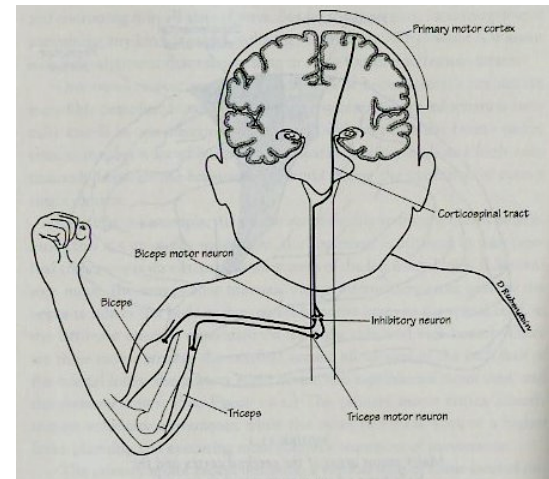
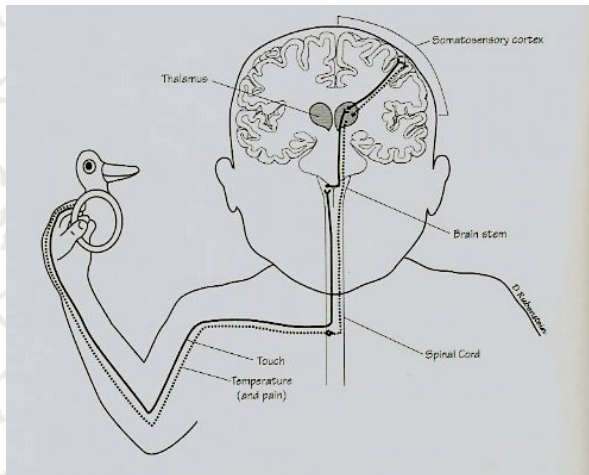


relaxed alertness

fosters appropriate reflex development

# The Essential Language/Reading Brain

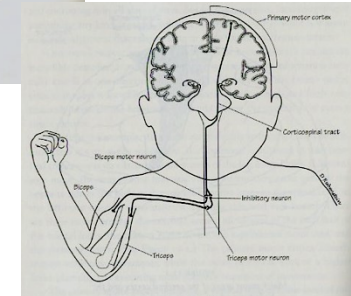
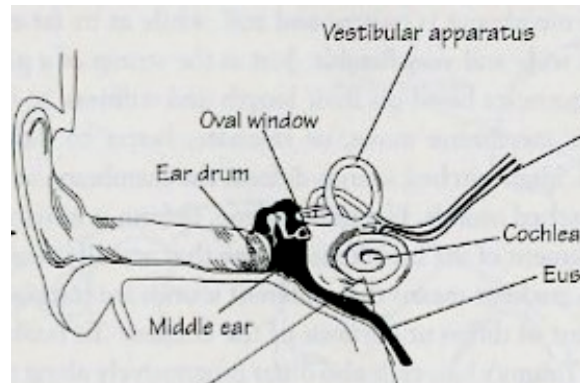
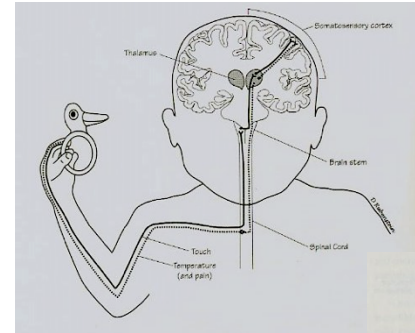
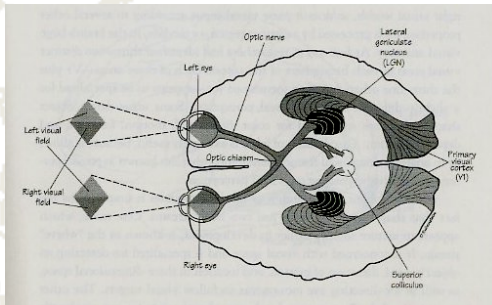
Attention to and storage of sensorimotor experiences





# The Essential Language/Reading Brain

Needs a combined sensory experience



# The Essential Language/Reading Brain

## READING NEEDS

### – Ability to combine motor, visual and auditory memories

- Blend sounds and symbols **f-r-o-g**
- Hold new blended sounds in memory
- Connect to create a whole word
- Connect to world experiences
- Head/neck movement: eye-hand coordination
- Relaxed alertness

### – Ability to hold new symbolic connections in memory



**frog**



# The Essential Language/Reading Brain

## READING NEEDS

- Ability to apply meaning to the combined words and experiences

**“I love to read”**

- Ability to recall the full impressions gained through the reading process
  - Images
  - Posture
  - Words
  - Word meaning
  - Understanding of content



# The Essential Language/Reading Brain

## READING NEEDS

- To be applied to everyday life memories
- To enhance abstract thinking



# The Essential Language/Reading Brain

The human brain is not hard-wired for reading







# Lexia and Dyslexia

**Lexia = related to language**

**Dyslexia = difficulties or disorders of language**

# Lexia – Ready for Language

## Auditory/Verbal Precursors

- Can easily name letters and their sounds
- Can smoothly blend sounds into words
- Can break words into sounds/syllables
- Does not transpose sounds in words

**PASGETTI**



# Lexia – Ready for Language

Visual and visual/motor precursors

- Easily recognize letters
- Enjoy working puzzles
- Block building is pleasurable
- Enjoy pencil/paper/coloring activities
- Understand the Alphabetic principle
- Eyes move regularly up and down and left to right



# Lexia – Ready for Language

## Sensorimotor

- Perceive lines – visually and can draw shapes
- Can feel and identify shapes
- Can perceive symbols (letters and numbers) and recognize them

III

000

////

6

9

2

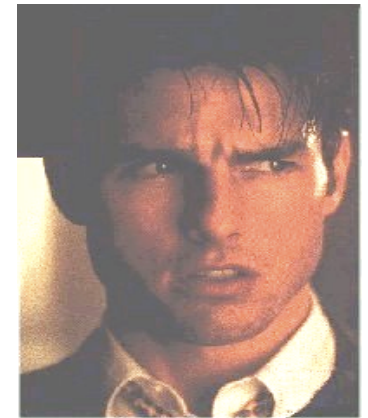
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S

# Dyslexia

Dyslexia is a difficulty with multisensory language:

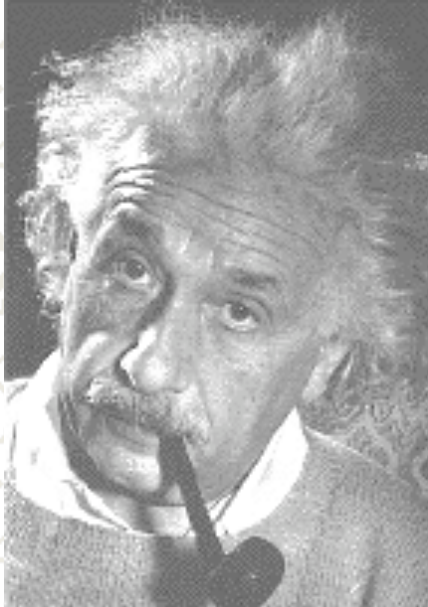
- **Attention, reception, storage, expression and regulation**
- **Can be verbal and nonverbal**
- **20% of people have dyslexia**
- **Can be identified by 5 – 6 years of age**



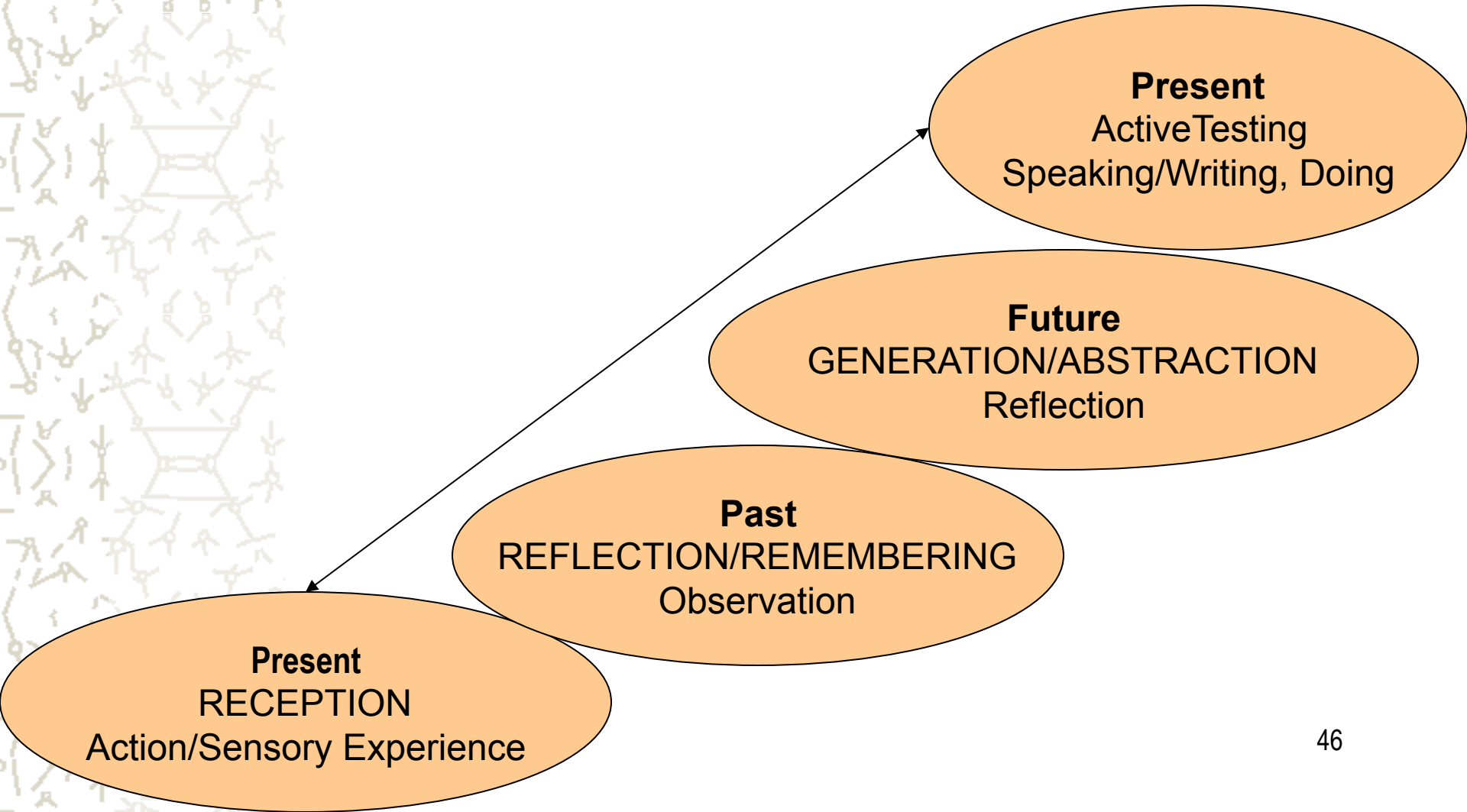


# Dyslexia

Students can be GIFTED and have Dyslexia

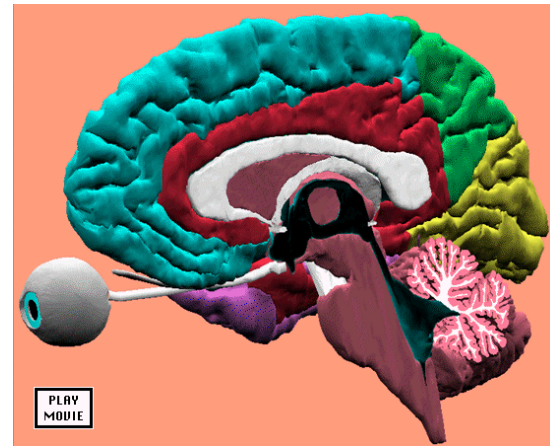


# How People Learn



# Turn On The Language Brain

Sooner is better for all children!



# Turn On The Language Brain

Essential Skills To.. UNLOCK THE CODE

**relaxed alertness**

/attention

- A yoga center
- Breathing exercises
- Silence Game
- Calming visualizations of “warm, fuzzy” experiences
- Massage – at home and school
- Places to walk
- Quiet space in the classroom



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

- **Smooth eye movement**
  - Ball tracking exercise –i.e. Ball Party
  - Catching – bean bag close together > further apart
  - Throwing - bean bag close together > further apart
  - Target throwing – large > small and near > far
  - T-Ball and basketball (without > with dribbling)
  - Relay games
  - Left to right presentation of materials

# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### – Body awareness and body control

- Balance beam
- Yoga center
- Yoga on line
- Walk on line carrying fragile object
- Walk with object balanced on head





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### – Body awareness and body control

- Slide
- Swing
- Spin
- Climb
- Crawl
- Pedal and steer a trike/bike
- Bounce ball
- Bounce on a ball



🚫 Watch the children who **AVOID** these



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### ■ Tactile awareness

- Sandpaper tiles with varying roughness/smoothness
- Blindfolded activities
  - Shape, size and texture matching
  - Simple to complex – 2 > more
- Play Doh
  - Open-ended creative >cookie cutters and rollers>letter shapes
- Sandbox
- Water table

# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### – Visual/motor integration

- **Communication between**
  - **Body awareness**
  - **Balance**
  - **Tactile**
  - **Visual**
    - » **Awareness of world and symbols**
    - » **Memory for visual world and symbols**
  - **Fine motor**





# Turn On The Language Brain

Essential Skills To.. UNLOCK THE CODE

The eyes must be able to perceive...

**Is the child's eye sight O.K.?**

**Is the lighting appropriate?**

**Colored lenses may help**

**Incandescent lights better than fluorescent**

**Is the material clear?**

**Is the work area appropriate?**

# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### ■ Visual awareness

- I-Spy
- Matching activities
  - Shape, size and color
- Gradation of size and color
- Vary the speed of presentation





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### – Strengthen visual connections

- **Puzzles – simple to complex**
  - Use words to describe what's on pieces – where do they go?
  - Turn pieces over
    - Find corners, flats and insies/outsies
- **Scanning games – can use playing cards, vocabulary cards, matching game cards**



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

Strengthen visual connections

– Foster visual motor connections

- **Puzzles and blocks**
  - Emphasize movement and muscles  
Used to complete each
- **Arts and crafts**
  - Cutting
  - Pasting
  - Coloring
- **Sand box**
- **Swings**
- **Slides**





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Strengthen visual connections

- Introduce puzzles from simple to complex
  - Use verbal cues when working puzzles
- Matching games
- Scanning games
- Categorizing activities – size, shape, color, function
- Foster block building that requires following picture directions
  - Use verbal cues to assist visual awareness

# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Strengthen visual memory

- Play memory games with cards
- Play I-Spy in the car and restaurants
- I-Spy computer game – intentional search
- Waldo
  - Read the extras
  - Look for them specifically
- “Taking a trip to.....” using pictures
- “Father owns a grocery store – using pictures
  - Open or alphabetic





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Strengthen Visual and motor connections

- **Perceiving lines**
  - Metal insets
  - Punching out shapes
- **Feeling shapes**
  - Mystery bag with varying objects – simple to complex
- **Perceiving symbols (letters and numbers) by touch**
  - Smooth, textured
  - Build their own from Play Doh or legos
  - Write in sand tray
- **Vibration on surface may help attention**

# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Strengthen visual and motor pathways

- Use multisensory techniques to teach letter/number awareness
  - Sandpaper, play dough, cookie etc.
  - Sand and water play
  - Say sounds as you go /d/ n
- Read books with the child – over and over and over and over....





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### – **Sound** perception/integration

- **Communication between:**
  - Environmental sound awareness
  - Human language sound awareness – reception
  - Human language expression
  - Memory for sounds
  - Memory for words, sentences, directions, paragraphs....





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### – Auditory awareness/connections

- Make sure auditory system is working properly
  - Speak softly to child – response?
  - Speak behind child – response?
  - Variability from day to day?
- Suggest that the family see a specialist if you suspect a problem



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### ■ **Auditory awareness/connections**

- **Surround the child/children with good music**
  - “Music for Babies” or “...Children”, etc.
- **Work with rhythms and rhymes**
- **Metronome and Rhythm Band can help**
- **Sing to and with the child/children**
- **Silence game – what sounds do you hear?**



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

- **Auditory awareness/connections**
  - Loud and soft sound identification
  - High and low sound identification
  - Gradation of sound cylinders
    - High to low and loud to soft
    - 3 cylinders to 6 or more
  - I – Hear with environmental sounds
  - I – Hear with phonemic sounds – have children watch and feel your mouth and neck and their own if necessary

# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Strengthen Auditory Connections

- Work with sounds in isolation
  - Change volume, pitch, and tone
  - Alter speed – ssslllooowww down
- Work with naming activities
- Use pictures to help with word find
- Read, read, read





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

- **Auditory awareness/connections**
  - **Need extra help?**
    - Use of LIPS program
    - Earobics, FasForward, and/or Lexia

# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Strengthen Auditory Connections

#### – Memory

- Use many finger plays
- Play directions following games
- Play a variety of memory games –environmental sounds, phonemes, pictures, symbols, sight words, etc.
- Smerge (a blending/memory game)





# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Strengthen Auditory Connections

- Be sure that each child is making the correct sounds
- Encourage two-way communication
  - Helps to develop external to internal speech
- Monitor TV /computers/video games
  - Time and
  - Content





# Turn On the Language Brain

Essential Skills To.. UNLOCK THE CODE

## Multisensory

- People who use all of their senses when they learn are better able to receive and store information



# Turn On The Thinking Brain

Essential Skills To.. UNLOCK THE CODE

Get the two sides of the brain talking

- Encourage seeing and saying activities
- Encourage saying and seeing activities
- Encourage “self-talk”
- Present letters and numbers with multisensory materials
- **Repetition, Recollection and Reflection**





# Turn On The Language Brain

Essential Skills To.. UNLOCK THE CODE

**Sound/Symbol Connection**

**AFTER child can:**

- make all sounds correctly
- identify symbols separately

**THEN begin sound/symbol connection**



# Turn On The Language Brain

Essential Skills To.. UNLOCK THE CODE

**Sound/Symbol Connection**

- Multisensory Reception
- Multisensory Recollection
- Multisensory Reflection
- Multisensory ACTIVE TESTING



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Sound/Symbol Connection

#### CONCRETE

### 1. Objects and Names

- Vocabulary objects grouped into basic sound families – bat, rat, etc.
- Intro each object and say its name – only a few at first – (See, Touch and Hear - Reception)
- Have child say the object's name – (See, Touch and Say – Recollection)
- Child says all names of objects – (See, Touch and Say - Reflection/Active Testing)





# Turn On The Language Brain

**Essential Skills To.. UNLOCK THE CODE**

**Sound/Symbol Connection**

## **2. Picture and Object Matching**

- **Show pictures with objects and names – (See, Touch and Hear Reception)**
- **Show picture and object matching – (See and Touch Reception)**
- **Child can match pictures and objects – (See and Touch Reflection/Active Testing)**



# Turn On The Language Brain

Essential Skills To.. UNLOCK THE CODE

**Sound/Symbol Connection**

## **3. Object and Picture and Names**

- **Child can say name of each object and picture – See, Touch and Say Active testing**



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Sound/Symbol Connection

#### Abstract

#### 1. Show - Picture, sound and word building

- Show one picture card. Say the word and say each sound in the word
- Show the child how you build the word using the moveable letters. Say each sound as you find the letter.
- Say the word as you move your finger along the letters
- Have the child say the sounds/read the word



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Sound/Symbol Connection

#### 2. Child builds one word that matches one picture

- Lay correct letters out
- Have child see and say name of picture.
- Have the child say each sound in the name
- Have the child build the name by saying each sound as he is building
- Have him say the word when complete by moving hand left to right along the letters.



# Turn On The Language Brain

## Essential Skills To.. UNLOCK THE CODE

### Sound/Symbol Connection

3. **Child builds all words of named pictures in set**
  - Intro another picture and build the word.
  - Child reads each word as completes the building



# Turn On The Language Brain

## Essential Skills To.. UNDERSTAND THE CODE

**As the children gain ability to blend sounds and build words**

- their proficiency as readers will grow
- their vocabulary will grow





# Turn On The Language Brain

**Essential Skills To.. UNDERSTAND THE CODE**

**Vocabulary building that accompanies experience  
increases comprehension**



# Turn On The Thinking Brain

## Essential Skills To.. UNDERSTAND THE CODE



**Social experience stimulates children's learning - especially as adults **guide participation****

**Language grows as adults **guide social experiences****

**Vygotsky**



# Turn On The Thinking Brain

## Essential Skills To.. UNDERSTAND THE CODE

- Comprehension grows through
  - Experiences
  - Visualizing and talking about experiences
  - Probing questioning
  - Open-ended questions



# Turn On The Thinking Brain

## Essential Skills To.. UNDERSTAND THE CODE

- Comprehension grows through:
  - Development of self-talk
  - “Visualizing” and other 2-sided brain activities
  - Reading books out loud to the child
  - Having the child read books out loud to someone

# Turn On The Thinking Brain

Teachers who foster meaningful collaboration



assist higher level thinking



# Turn On The Thinking Brain

## With multisensory life experiences

- Received
- Recollected
- Reflected upon
- And Actively tested

Children's language and learning will grow and develop in positive ways



# Support in the Classroom

**Some children need extra support as they become self-sufficient readers**





# Support In The Classroom

**Some school-aged students need:**

**– THE GIFT OF TIME**

- Extra time for tests
- Shortened assignments
- Assisted reading
- Study guides for test preparation

**– Assisted writing**

**– Spelling treated as a separate subject**

**– Alternative assignments**



# Support In The Classroom

Many students with **visual problems** need:

- A guide card while reading
- Two guide cards while taking tests that have an answer sheet
- Minimized copying from board and books
  - Have them take notes for practice
  - Supply full set of clear notes



# Support In The Classroom

Some students with **auditory problems** need:

- Words slowed down
  - Directions
  - Explanations
- Much repetition of verbal input
- Much visual, whole presentation
- Warning when they will be called on
- Spelling treated as a separate subject



# Support In The Classroom

Many students with **memory problems** need:

- Repetition
- Clarification
- Assignment structure assistance
  - Missing, late, incorrectly completed assignments are “symptoms” of the need for greater support
- Memory devices (Memory Power for Exams, etc.) often using both sides of the brain
- Books on tape
- MUCH VISUAL, WHOLE presentation



# Support In The Classroom

Students often need **math** assistance:

- Recognition of their math talent
- Math fact learning assistance plus calculator
- Use of a calculator that shows whole math sentence
  - See and say
- Math problem “cheat sheets”
- Recognition of their difficulty with sequential solving
- No speeded math fact tests
- Graph paper or vertical lines when doing math





# Support In The Classroom

**All students need to be encouraged to use good posture**

- Feet flat on the floor or resting on a stool
- Straighten back
- Straighten head
- Head elbow distance from work
- Pencil held where both eyes can see at the same time



# **Support** In The Classroom

Some students need:

- **An environment free of pattern glare**
  - Reduce the area of the test that is visible
  - Reduce contrast between lines
  - Reduce light levels or use properly prescribed tinted lenses
  - Change the size of text
- **Seating in the least distracting portion of the classroom**

# Support In The Classroom

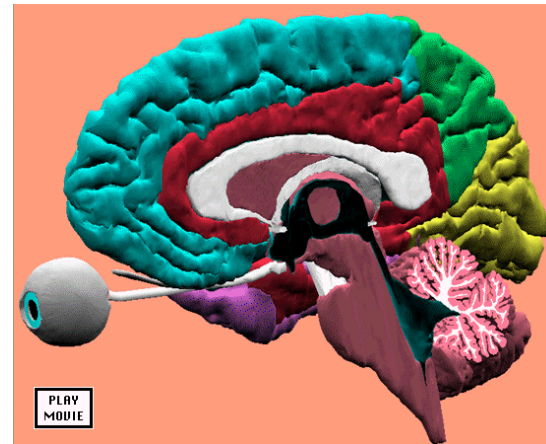
All students need:

- Adults who are patient
- Supportive adults who understand
- Plans that breed success
- Supportive classmates



# Turn On The Language Brain

Sooner is better!





# Brain design is NOT Destiny

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