Child Development: Brain Building

EarlyEdU Alliance®

Objectives

- Demonstrate knowledge of brain development of children birth to age 5.
- Demonstrate an understanding of the key roles that individual differences and family, program, and socio-cultural contexts play in development.
- Apply strengths-based strategies to build positive relationships with and between children and families to support health brain development.

Intentional Teaching Framework

Image credit: EarlyEdU

Head Start Early Learning Outcomes Framework

	CENTRAL DOMAINS				
	APPROACHES TO LEARNING	SOCIAL AND EMOTIONAL DEVELOPMENT	LANGUAGE AND LITERACY	COGNITION	PERCEPTUAL, MOTOR, AND PHYSICAL DEVELOPMENT
▲ INFANT/ TODDLER DOMAINS	Approaches to Learning	Social and Emotional Development	Language and Communication	Cognition	Perceptual, Motor, and Physical Development
● PRESCHOOLER DOMAINS	Approaches to Learning	Social and Emotional Development	Language and Communication	Mathematics Development	Perceptual, Motor, and Physical Development
			Literacy	Scientific Reasoning	

Image credit: Office of Head Start

Framework Guiding Principles

- Each child is unique and can succeed.
- Learning occurs within the context of relationships.
- Families are children's first and most important caregivers, teachers, and advocates.
- Children learn best when they are emotionally and physically safe and secure.
- Areas of development are integrated, and children learn many concepts and skills at the same time.
- Teaching must be intentional and focused on how children learn and grow.
- Every child has diverse strengths rooted in their family's culture, background, language, and beliefs.

What Is the Brain?

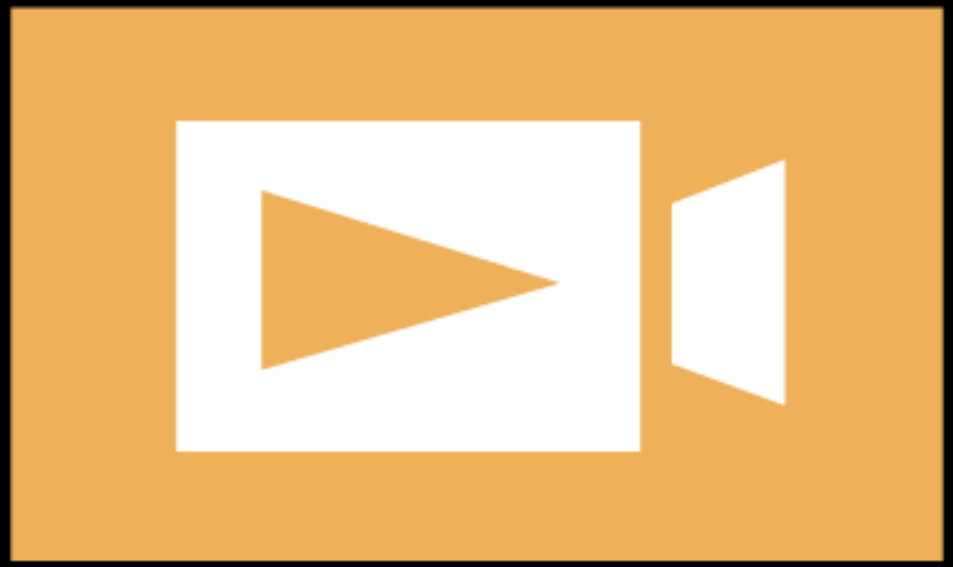
Discussion: Brain Definition

Turn to a partner and discuss the question: What is the brain?

Image credit: EarlyEdU

Video Intro: *How the Brain Works*

Now we'll review this information on how the brain works with a brief animation.



VIDEO: *How the Brain Works*

Regions of the Brain

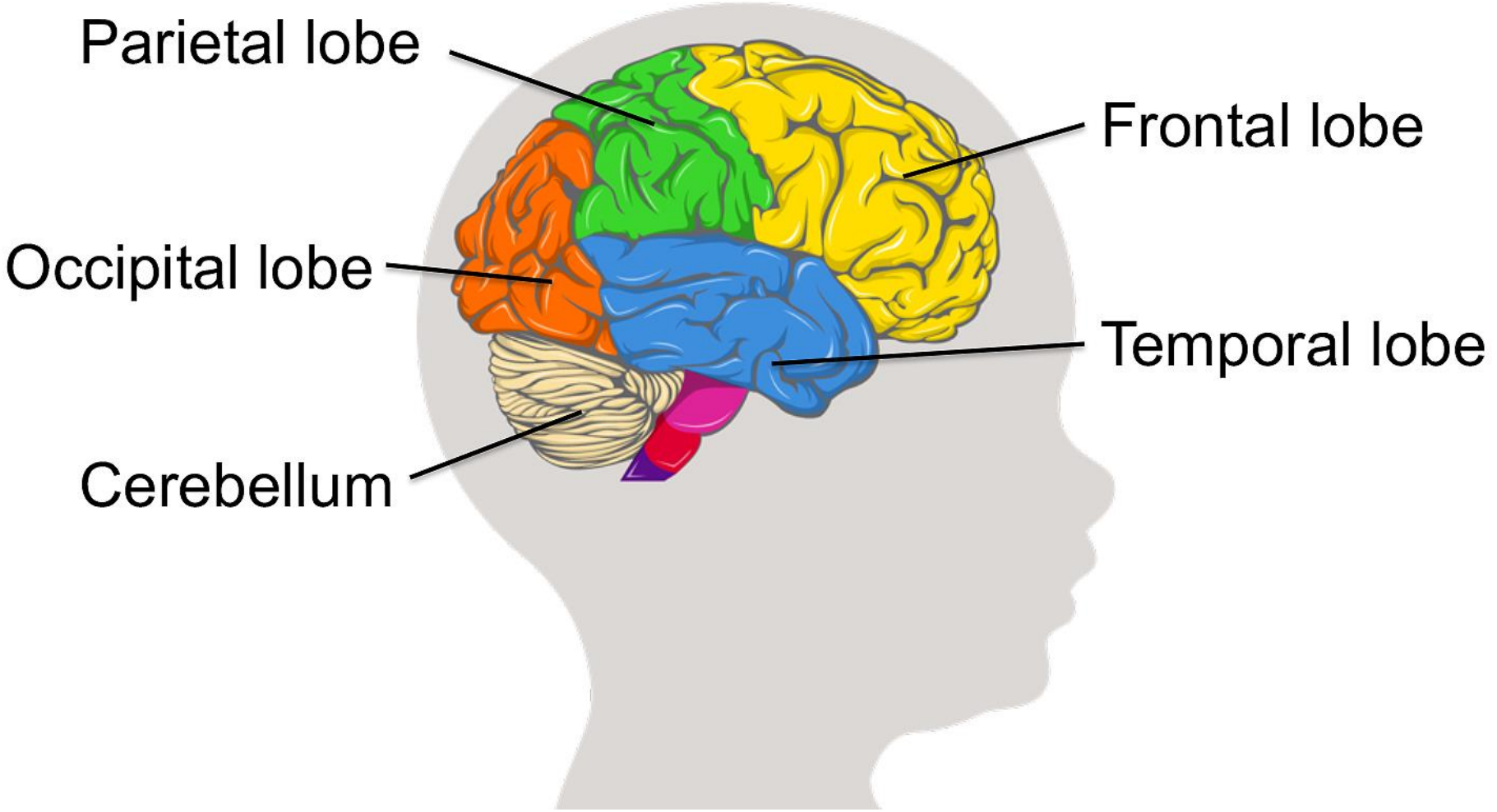
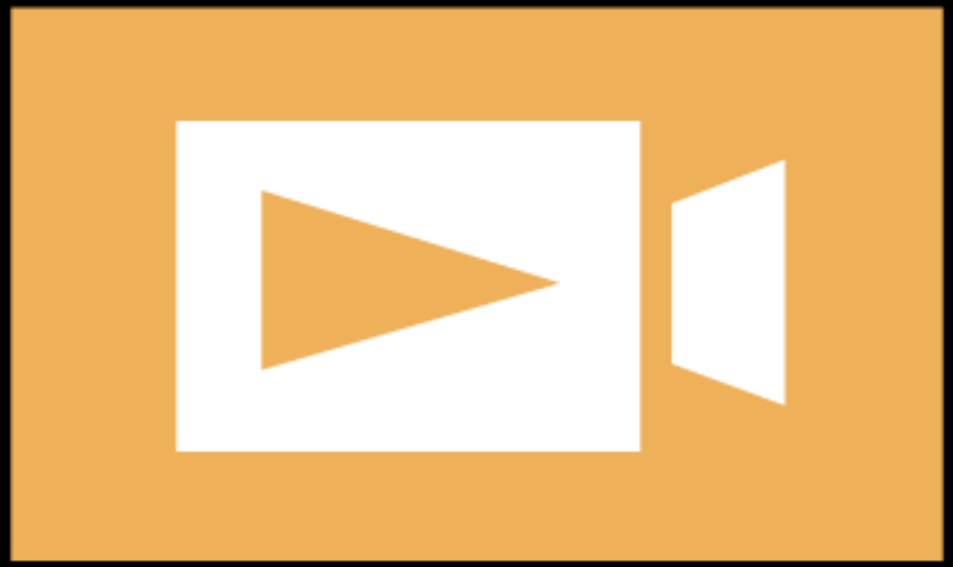


Image credit: EarlyEdU

Video Intro: *Colors on the Piano*

As you watch the following video, identify which brain areas the child may be using.



VIDEO: *Colors on the Piano*

Video Debrief:
Colors on the Piano

Which of the child's brain regions do you think were active?

Brain Development

Birth	1 year	5 years	10 years	18 years
25%	75%	90%	95%	100%

Video Intro: *Brain Building Basics*

As you watch the video linked below, listen and watch for five practices that adults can do to help young children's brains grow.

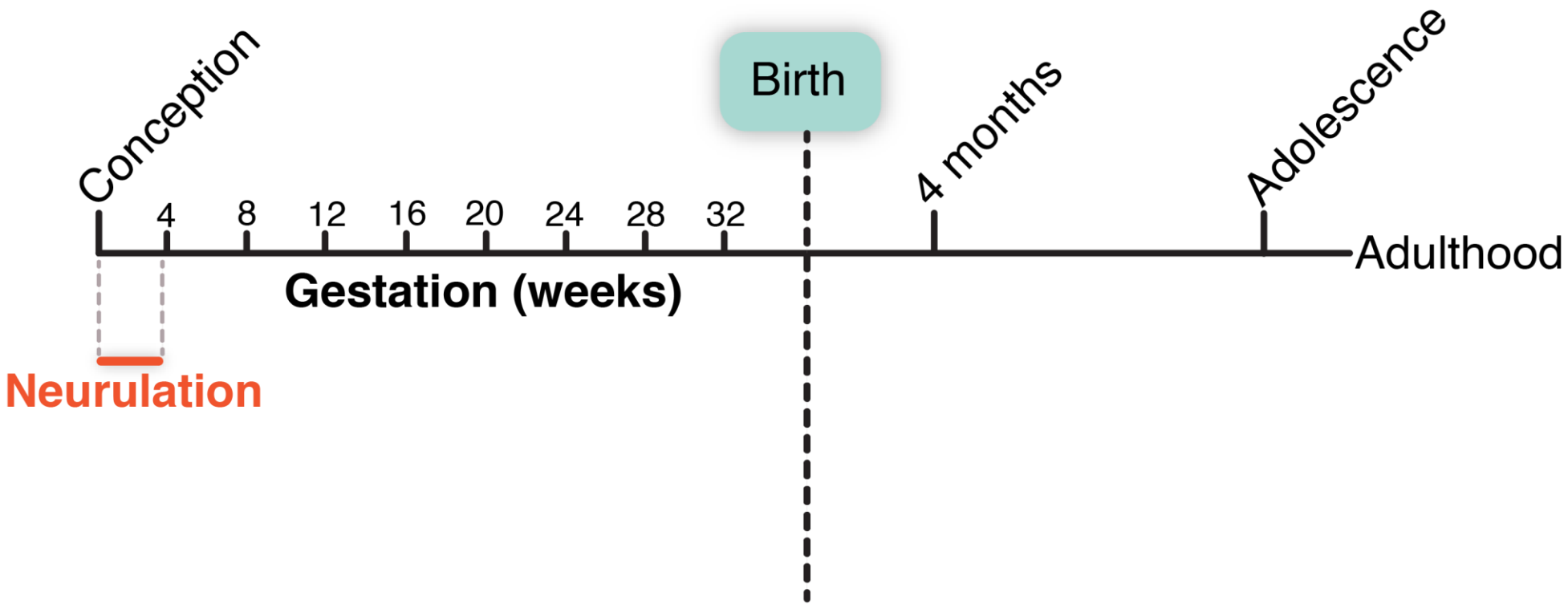
Vroom. (2016, August 8). *Brain building basics* [Video file].

https://www.youtube.com/watch?v=WQNm4ASB7iY

Video Debrief: *Brain Building Basics*

Name five practices you learned about that can help build young children's brains.

Early Formation of the Nervous System



(Adapted from Giedd, 1999, p. 4)

Neurons

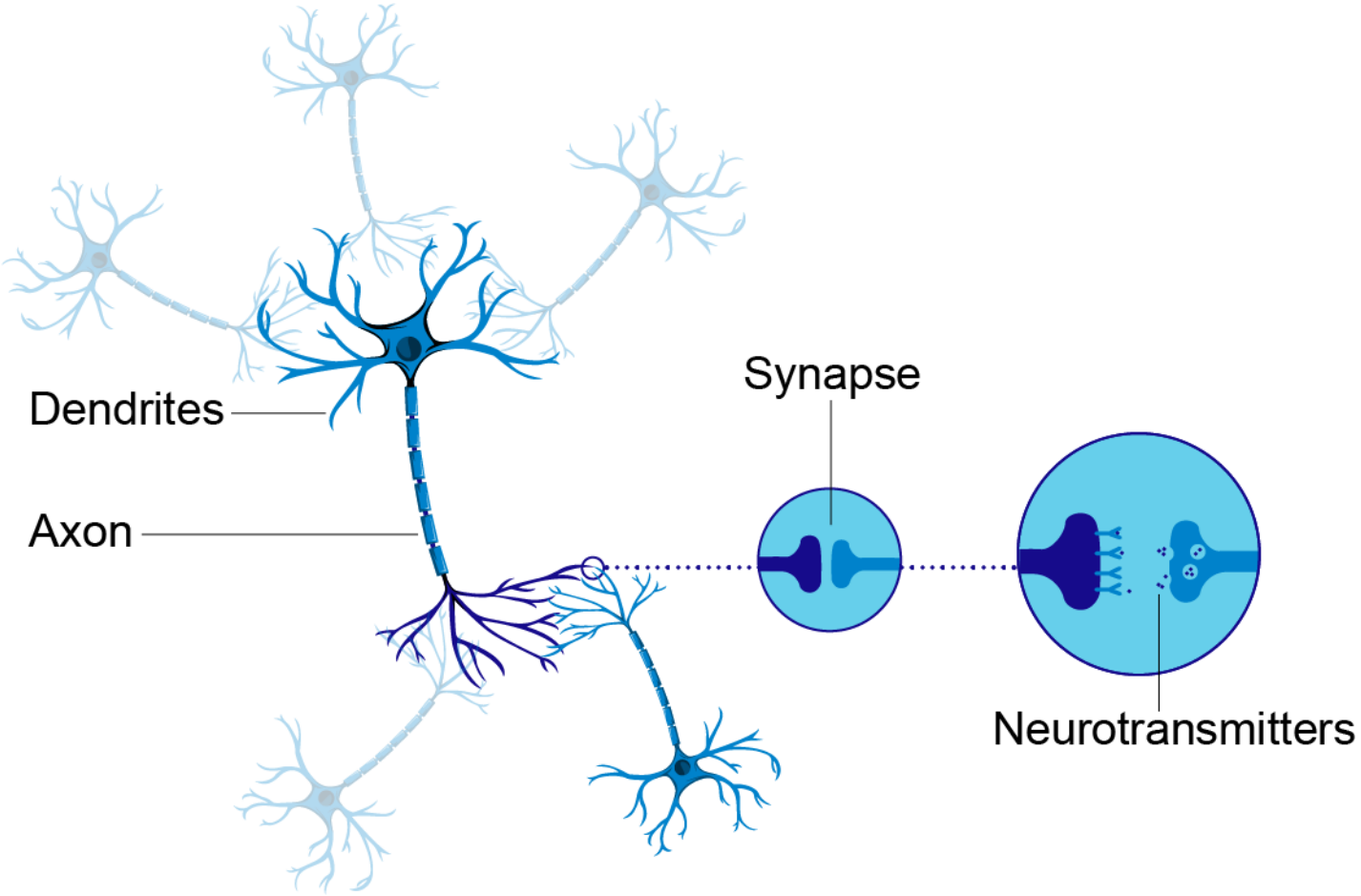


Image credit: EarlyEdU

Trillions of Connections

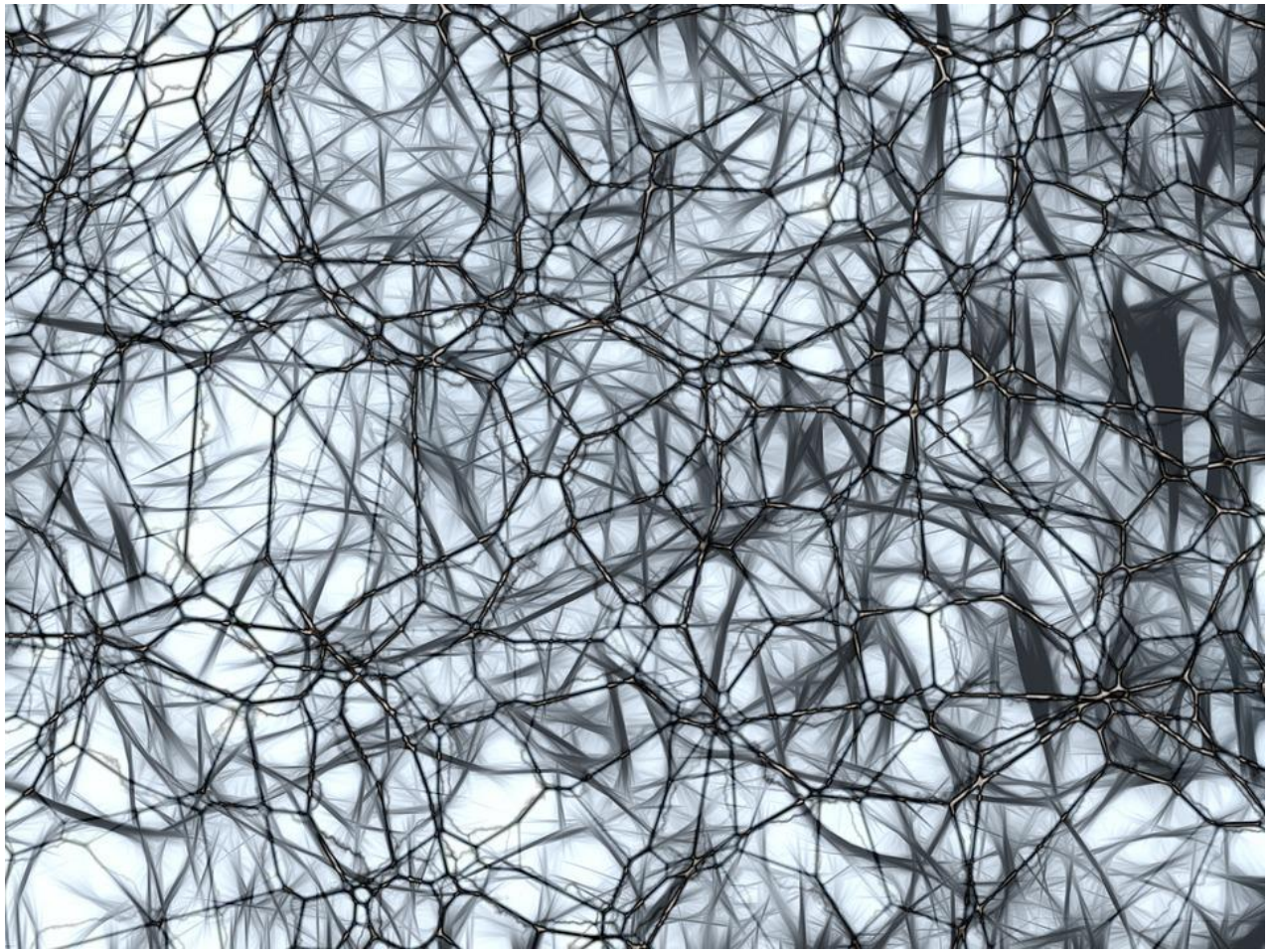
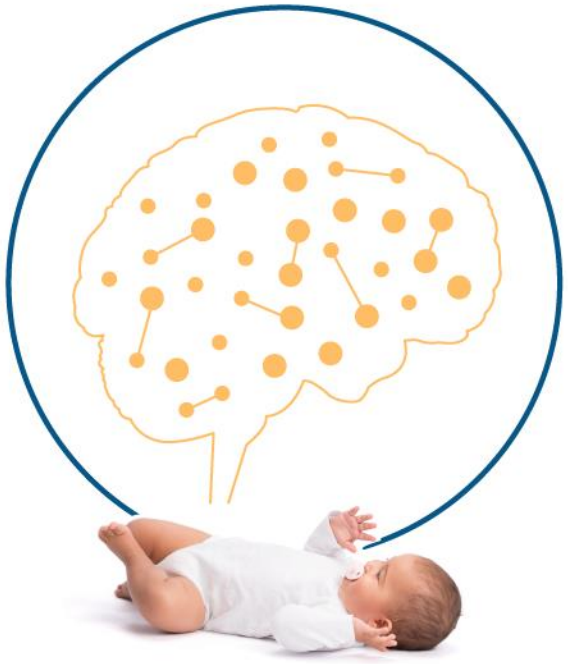


Image via Pixabay

How Connections Develop



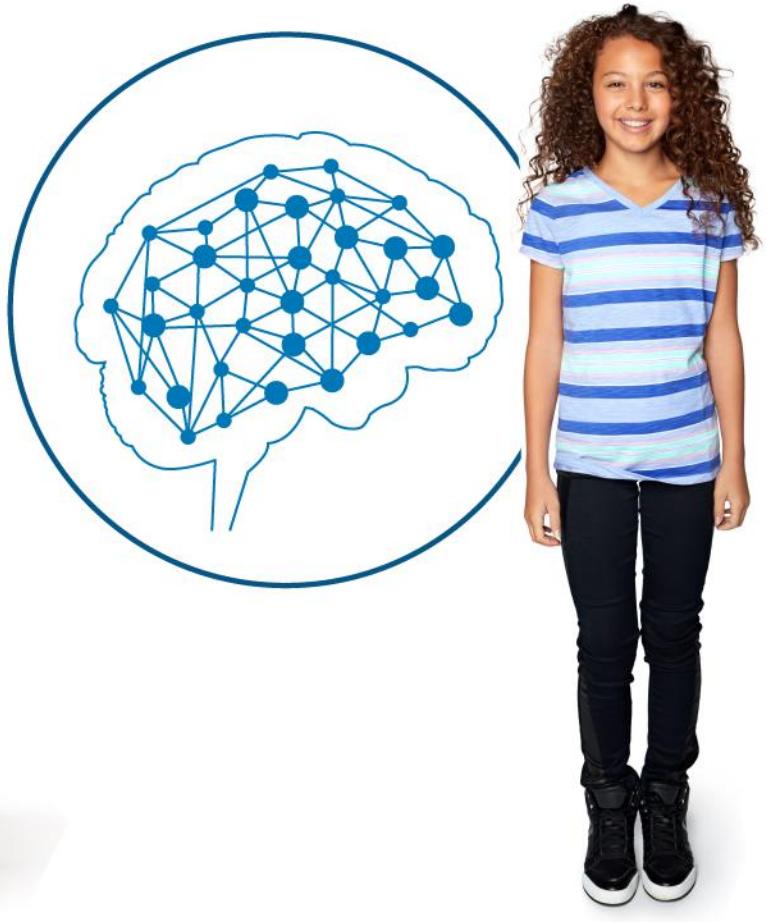


Image credit: EarlyEdU

Pruning Connections

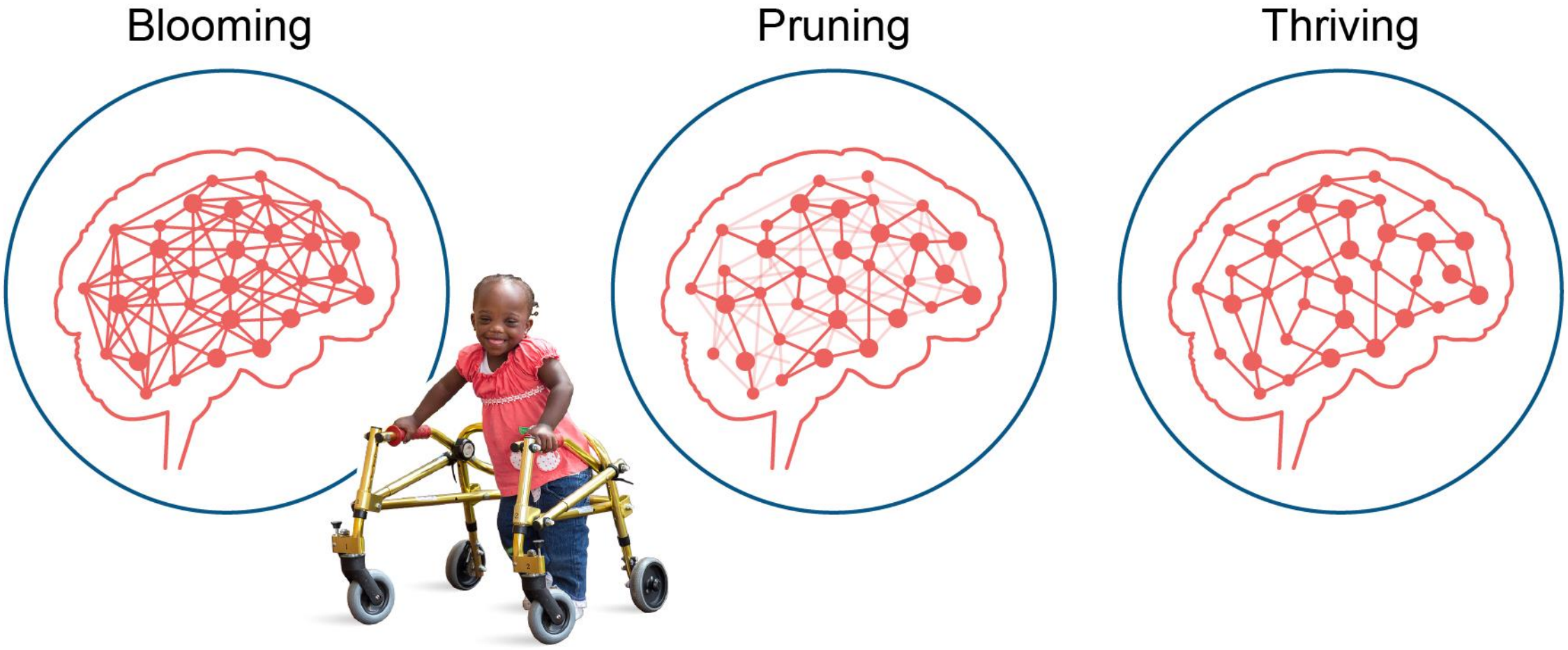


Image credit: EarlyEdU

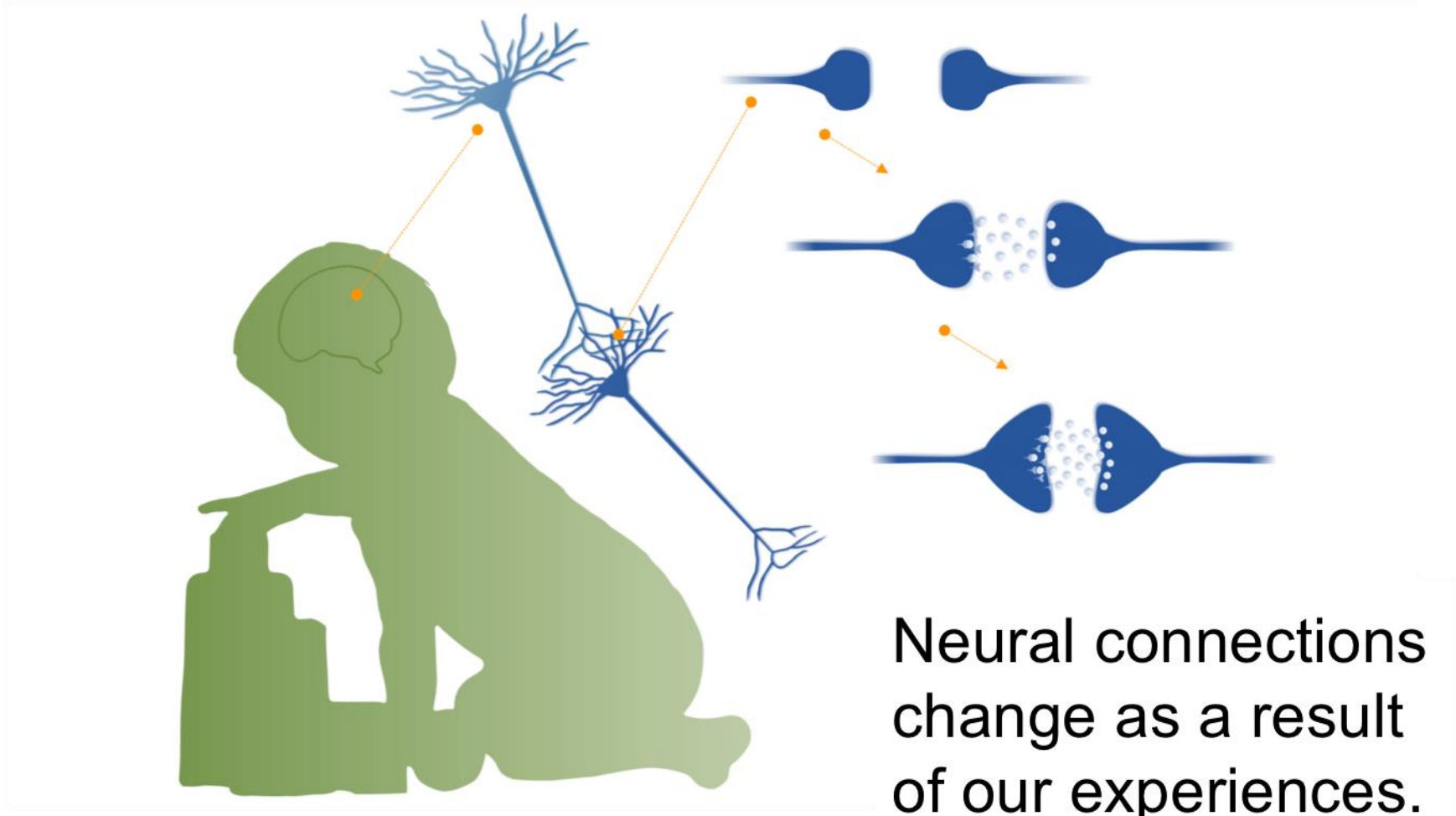
Nature AND Nurture

The Brain: Nature AND Nurture

"Heredity deals you the cards; environment plays them."

(Myers, 2011, p. 112)

Experiences Shape Connections



Neural connections change as a result of our experiences.

Experience Expectant

Image credit: EarlyEdU

Experience Dependent

Image credit: EarlyEdU

The Active Learner

Image credits: EarlyEdU

Epigenetics

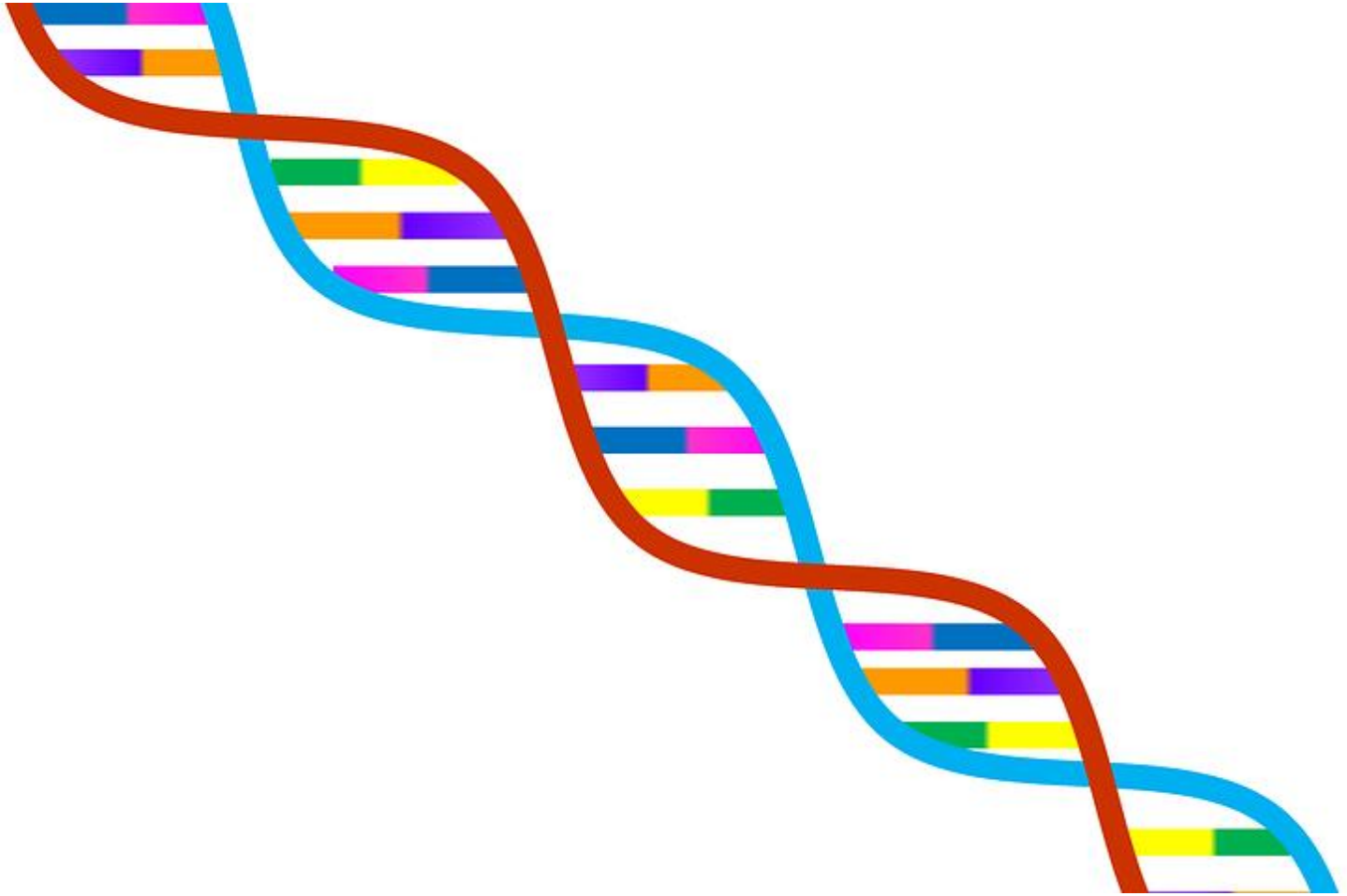


Image via Pixabay

Discussion: Early Experiences Matter

Choose a partner and talk about the daily experiences of children in their programs

What are the children learning from those experiences?

- Would you change those experiences in any way to help support their learning?
- What impact does the child's culture have on their daily experiences?

Neuroplasticity

Image via Pixabay

Activity: Supporting Brain Development

- Form small groups and review the handout.
- Choose one of the elements that are important for healthy brain development.
- Discuss and respond to the questions.

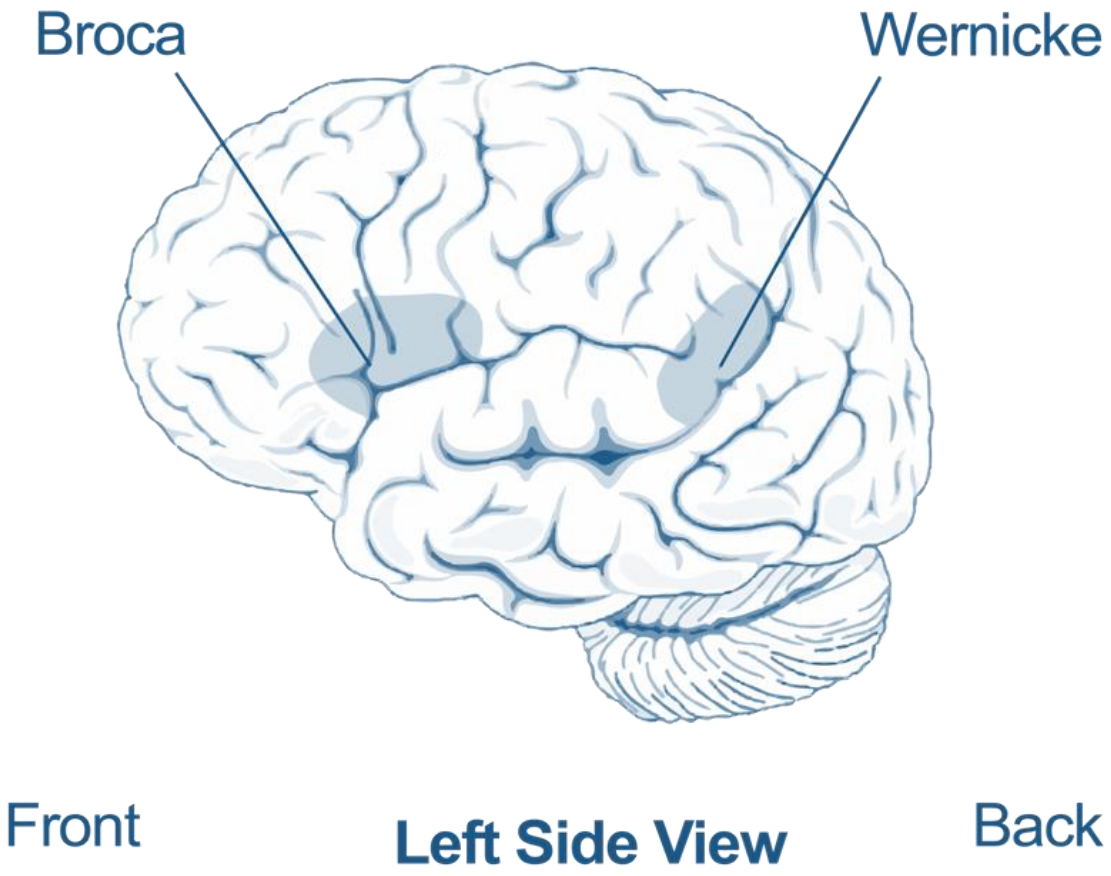
Activity: The Brain

What is the brain and how does it learn?

Illustrate your responses with a drawing.

The Brain and Language

Wernicke's and Broca's Areas

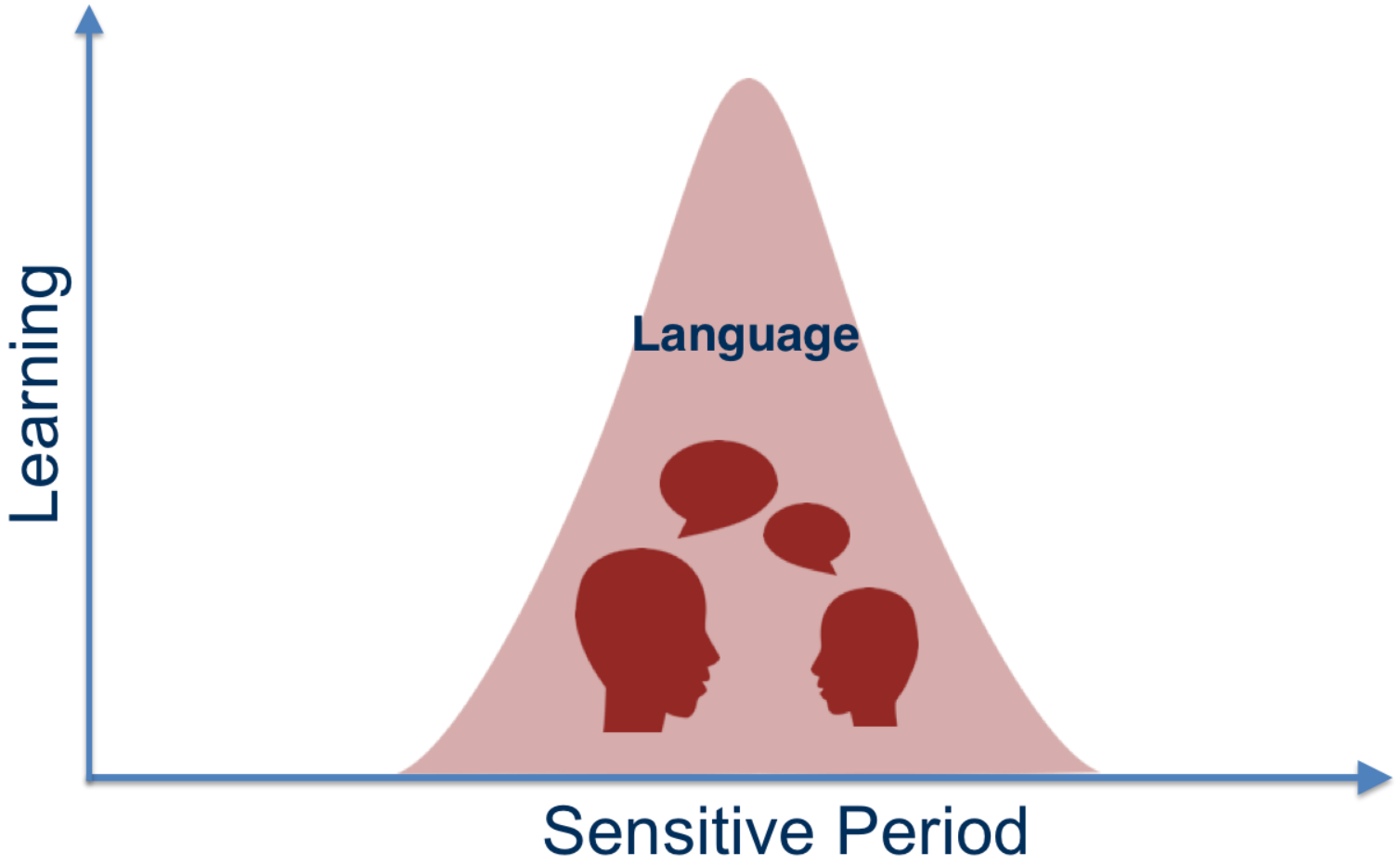


Wernicke's area:
Language perception

Broca's area:
Language production

(Adapted from National Institute on Deafness and Other Communication Disorders, 2015, p. 1)

Sensitive Period



Reading and the Brain

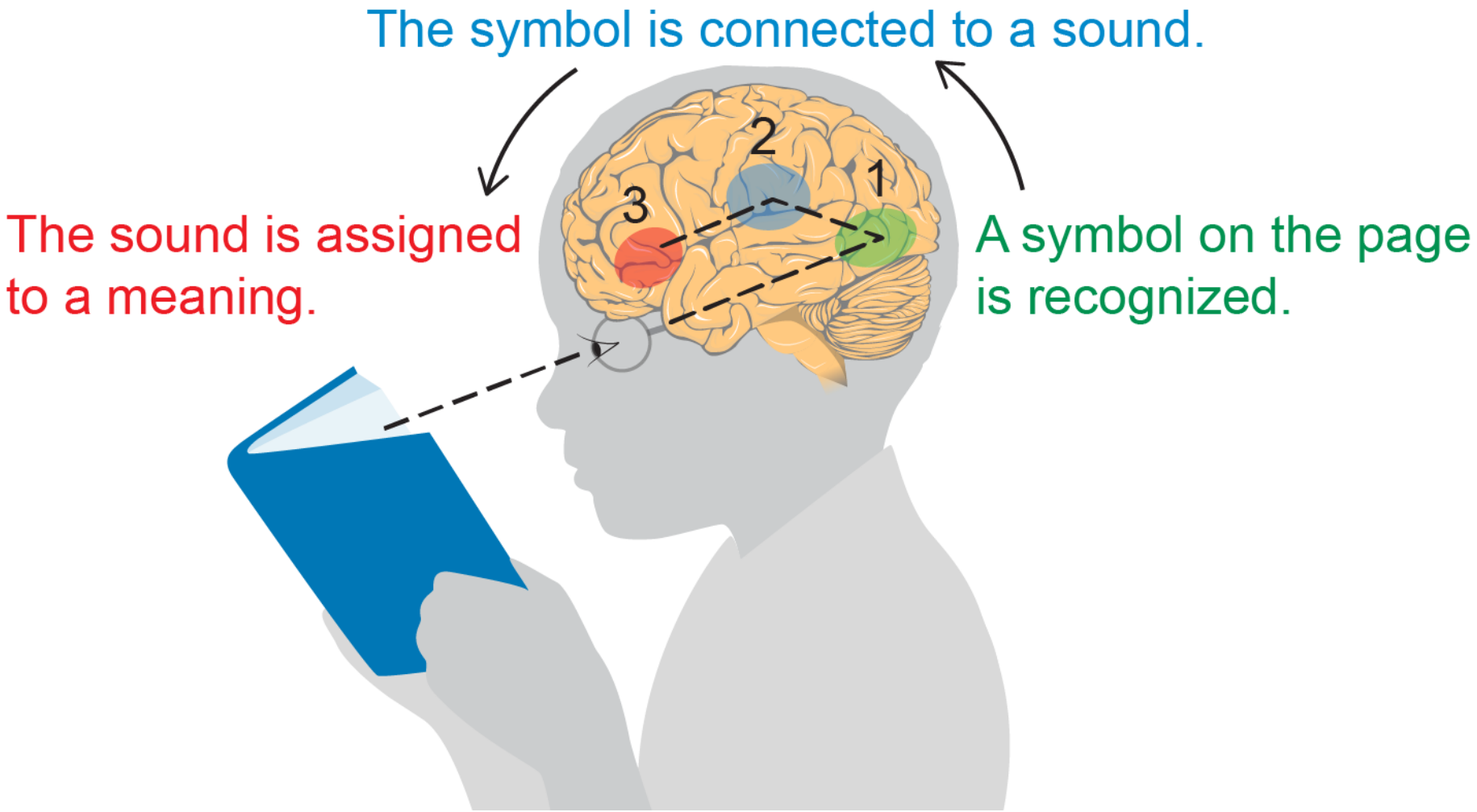


Image credit: EarlyEdU

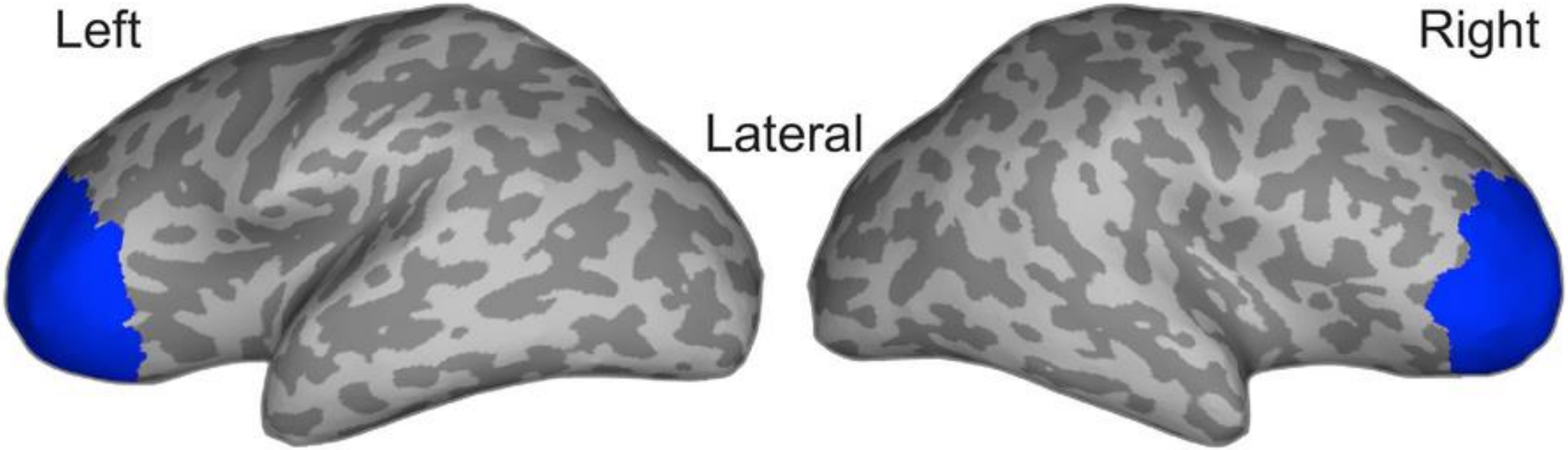
What is Bilingualism?

Image credit: EarlyEdU

- *Bilingualism* is the ability to speak two or more languages.
- **Bilinguals,** or children who are **dual language learners (DLLs)**, are learning two or more languages at the same time.

Cognitive Benefits of Bilingualism

Activity in Prefrontal Cortex



(Ferjan-RamÍrez et al., 2016)

Discussion: Language and the Brain

Section review:

- Children build their brains over the course of childhood.
- Connections form in the brain through biology and experiences.
- Children's brains are primed to learn language.
- Even children not yet talking are listening and forming connections in the brain's language regions.

Discussion:

What are your favorite ways to support language development of young children?

The Brain and Executive Function Skills

Executive Function

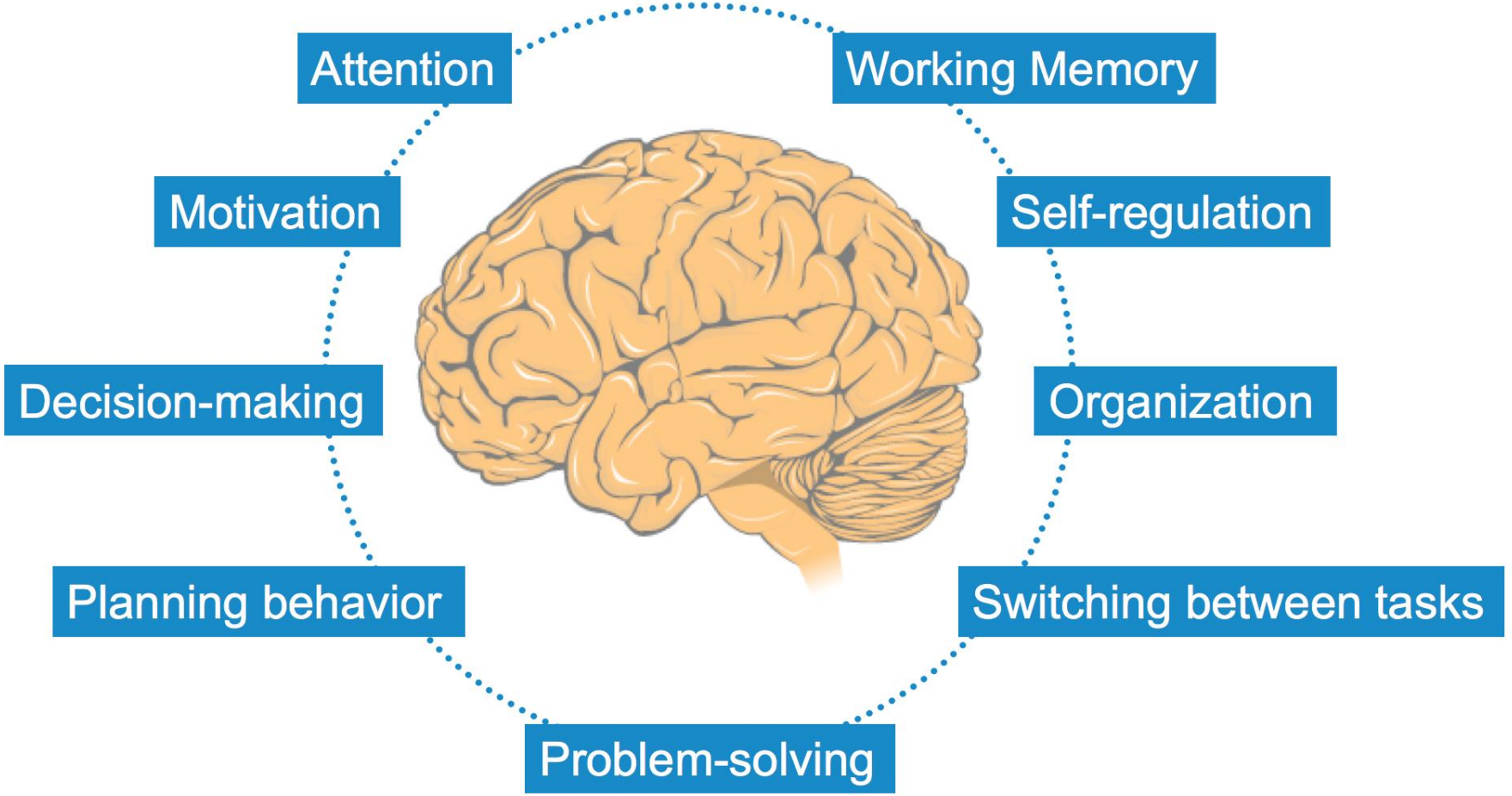
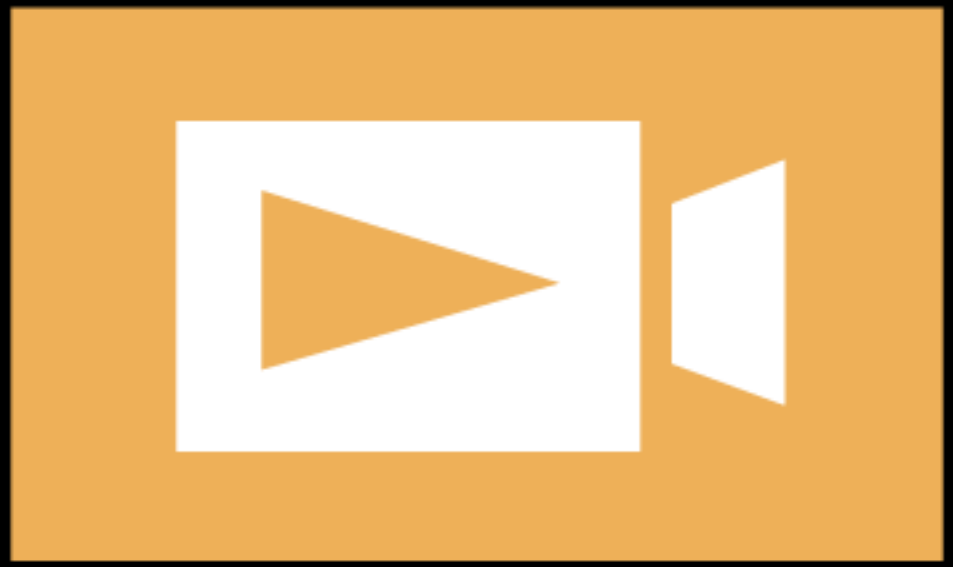


Image credit: EarlyEdU

Video Intro: *Executive Function Skills*

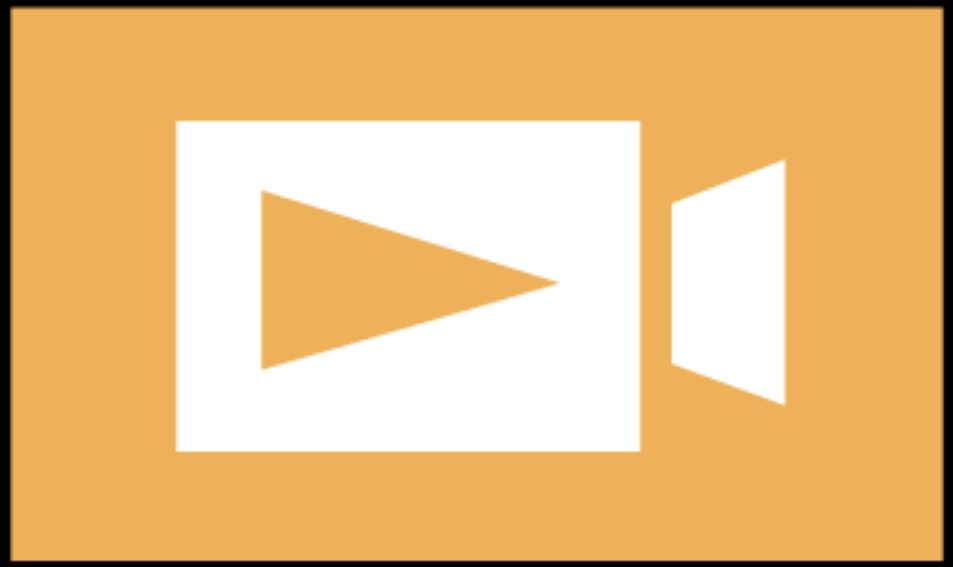
In the following video, Dr. Juliet Morrison, from Washington State's Department of Early Learning, and Dr. Gail Joseph, from the University of Washington, discuss executive function skills.



VIDEO: *Executive Function Skills*

Video Intro: *The Timer*

As you watch the video, identify when children are building executive functioning skills, including maintaining focus, persisting in an activity, and flexibility in thinking and behavior.



VIDEO: *The Timer*

Video Debrief: *The Timer*

What executive function skills were children working on?

Play and Self-Regulation

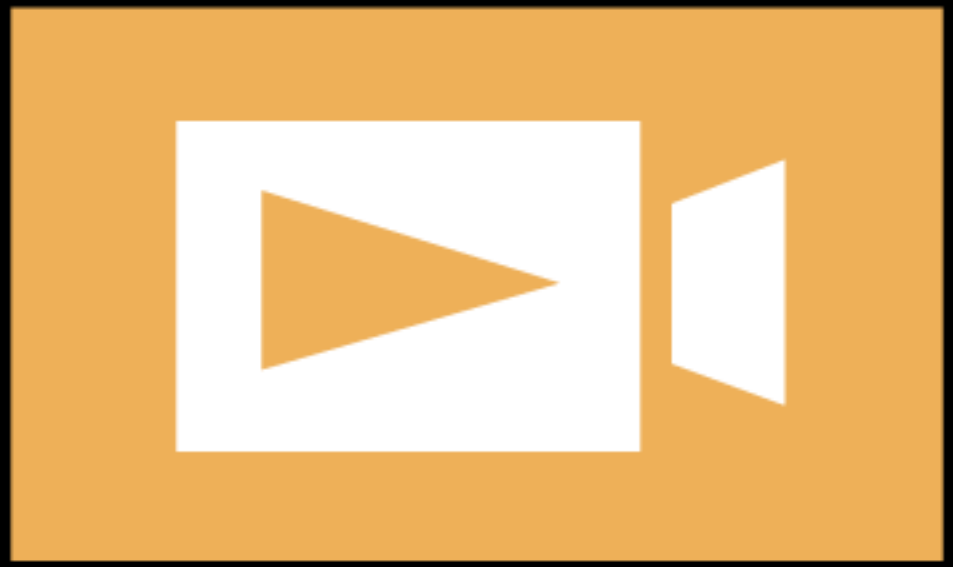
Image credit: EarlyEdU

Rule-Based Play

Image credit: EarlyEdU

Video Intro: *Exploring Shapes and Sounds*

- As you watch the video, identify when children are building executive functioning skills including maintaining focus, persisting in an activity, and flexibility in thinking and behavior.
- How does the educator support skill-building in these areas?
- What more could the educator have done?



VIDEO: *Exploring Shapes and Sounds*

Video Debrief: *Exploring Shapes and Sounds*

- When are children building executive functioning skills including maintaining focus, persisting in an activity, and flexibility in thinking and behavior?
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Activity: Head, Shoulders

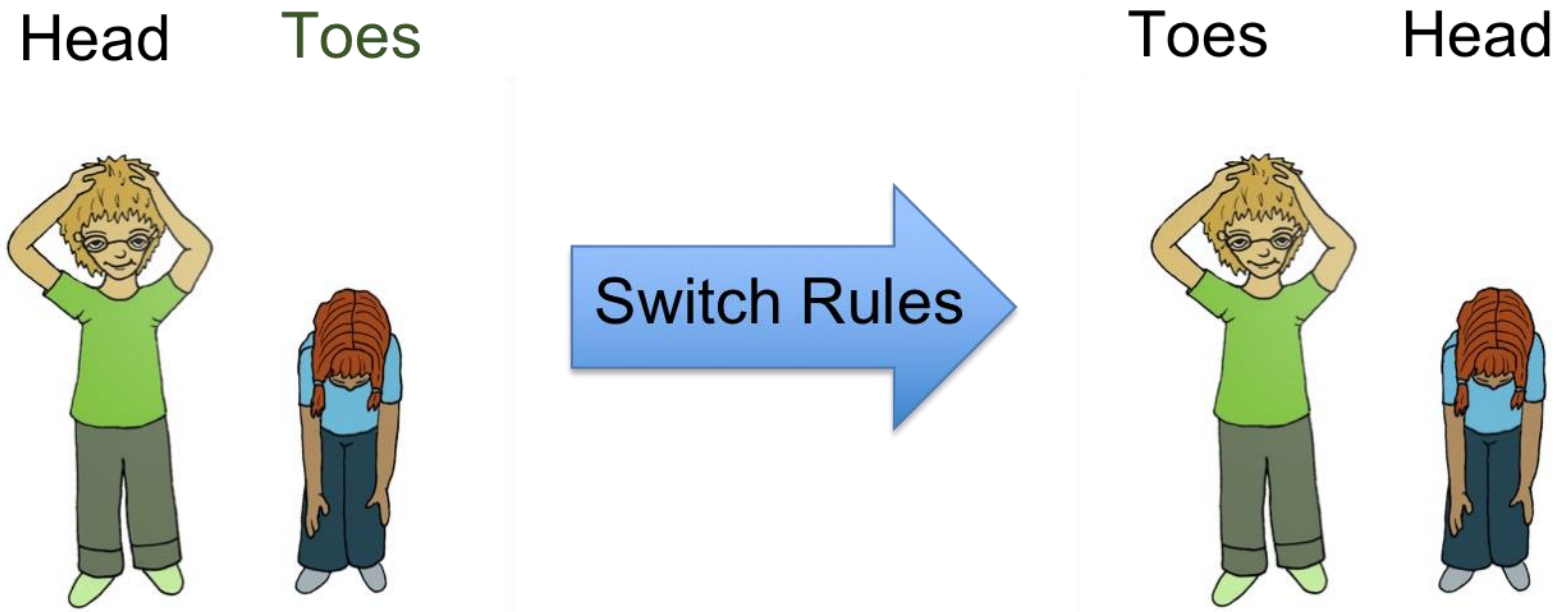

Image credit: Head Start Center for Inclusion

The Brain and Stress

Stress Is a Continuum

Image credit: EarlyEdU

Discussion: Buffering Stress

Discuss these questions in small groups:

- How would you buffer a child's stress?
- What could you do to support a child who is experiencing a stressful situation?

ACEs Can Cause Toxic Stress

Persistent and acute stress from ACEs can:

- Cause toxic stress.
- Impact the developing brain.

The Stress Response System

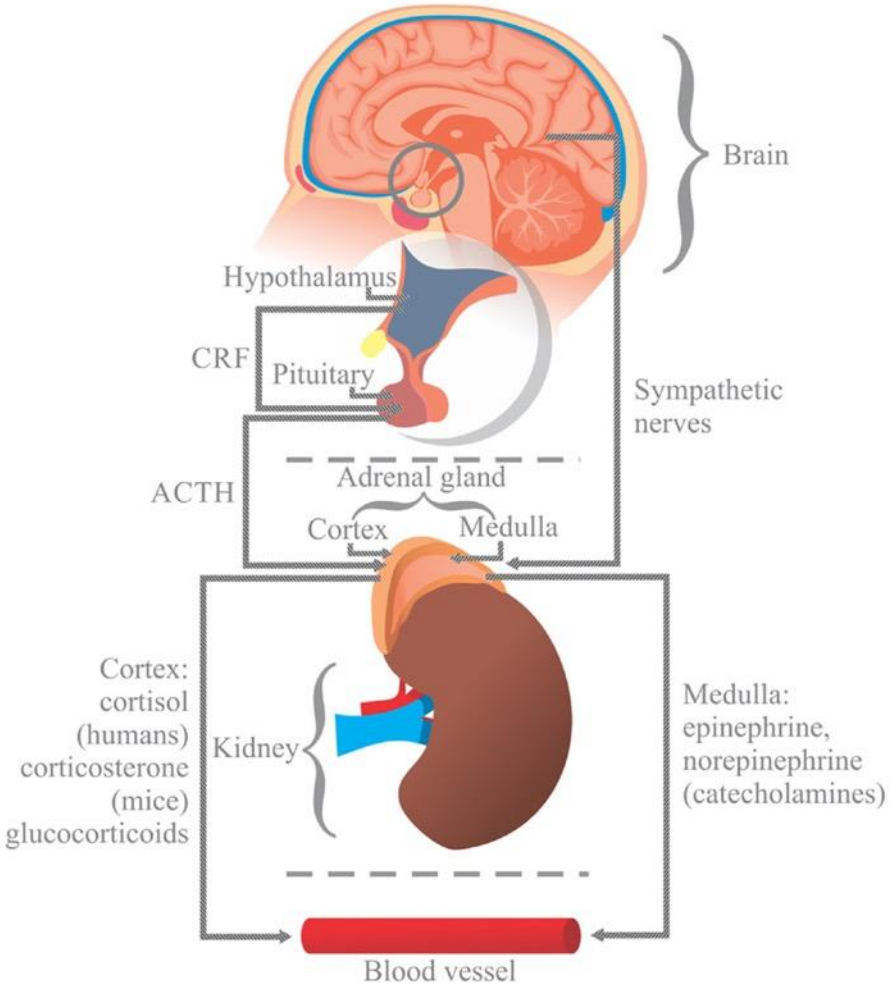

Image credit: Campos-Rodríguez et al., distributed under a CC BY-3.0 license

Video: *How Does the Toxic Stress of Poverty Hurt the Developing Brain?*

As you watch this video, think about:

- What are examples of normal, everyday stress and examples of toxic stress?
- What makes toxic stress so toxic?

PBS NewsHour. (2015, June 27). *How does the 'toxic stress' of poverty hurt the developing brain?* [Video file].

http://www.pbs.org/newshour/bb/toxic-stress-poverty-hurt-developing-brain/

Video Debrief: *How Does the Toxic Stress of Poverty Hurt the Developing Brain?*

- What are examples of normal, everyday stress and examples of toxic stress?
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Impact on Development

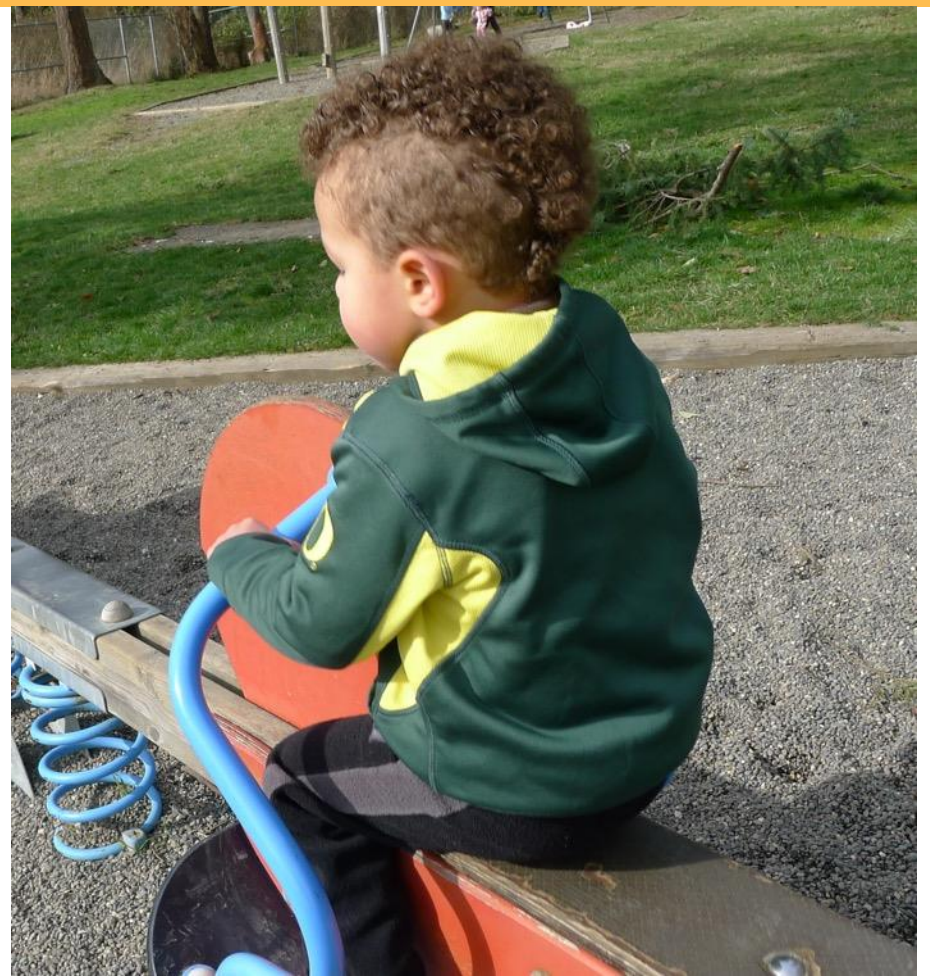


Image credit: EarlyEdU

Video: *Head Start -Trauma Smart*

As you watch this video, observe how early childhood educators can help children who have experienced trauma.

Robert Wood Johnson Foundation. (2014, March 20). *Head Start-Trauma Smart* [Video file].

https://youtu.be/bXzKVpiSzH8

Video Debrief: *Head Start - Trauma Smart*

What are some ways that early learning professionals can support children who have experienced trauma?

A Strengths-Based Approach

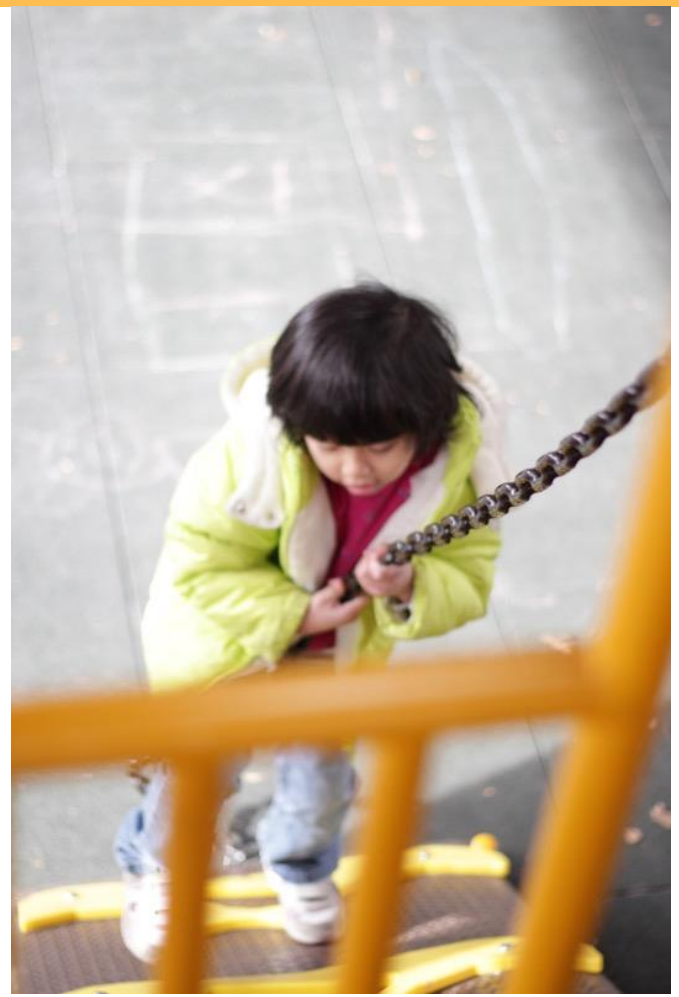


Image credit: EarlyEdU

Activity: Resource Development

Identify 3-5 resources in your community that you can turn to or refer parents to when families are experiencing challenging circumstances.

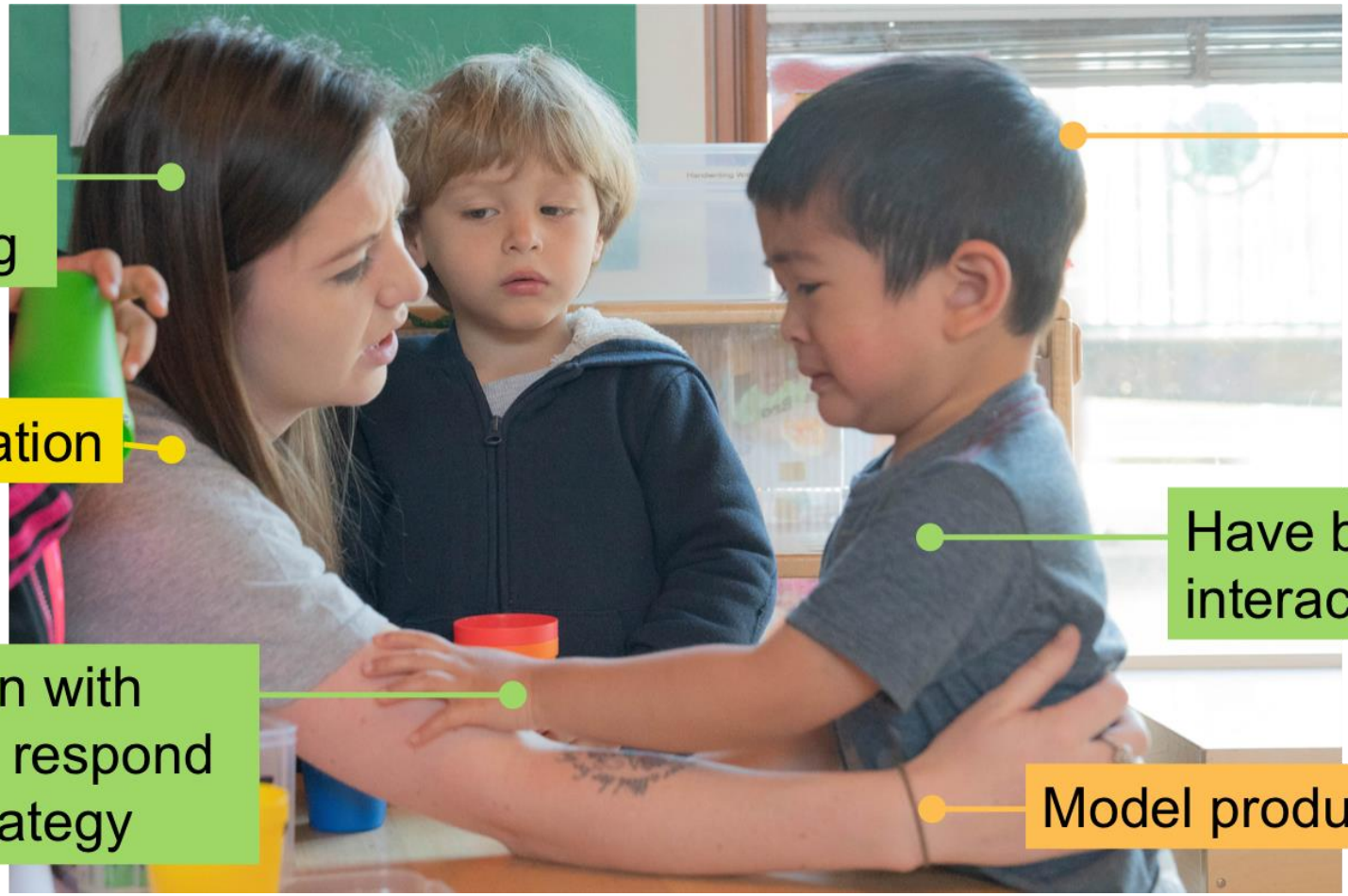
Responsive Interactions

Image credit: EarlyEdU

Discussion: Importance of Responsive Care

- What does attentive, responsive care look like?
- Why is responsive care important for children's emotional and behavioral self-regulation?

Scaffolding Through Responsive Interactions



Encourage problem-solving

Support exploration

Provide children with enough time to respond or try a new strategy

Follow the child's lead and respond to their cues

Have back-and-forth interactions

Model productive behaviors

Image credit: EarlyEdU

EarlyEdU Alliance®

Appendix: OPTIONAL Stroop Test Activity

As fast as you can, instead of reading the word, name the color of each word on the following slides.

GREEN

RED

YELLOW

BLUE

BLACK

ORANGE

GREEN

RED

YELLOW

BLUE

BLACK

ORANGE

How Did You Do?

GREEN	GREEN
RED	RED
YELLOW	YELLOW
BLUE	BLUE
BLACK	BLACK
ORANGE	ORANGE