

# INTRODUCING IT: Understanding the Science of Early Development and the Core Story



## WATCH IT (8:08 minutes total)

[The Science of Early Development](#) (3:58 minutes)

[Core Story: Experiences Build Brain Architecture](#) (1:57 minutes)

[Core Story: Serve & Return Interaction Shapes Brain Circuitry](#) (1:42 minutes)

[Core Story: Toxic Stress Derails Healthy Development](#) (1:51 minutes)

(The Center on the Developing Child, Harvard University, 2011)

**These four, short videos from the Center on the Developing Child at Harvard University cover the science of brain development after birth and three important concepts around its architecture.** Video #1 discusses the science of early childhood development. Videos #2, #3, and #4 tell the “core story,” or the three fundamental and most important concepts related to early brain development; that development is impacted by a child’s experiences in the first three years, healthy interactions build the brain, and high levels of stress sends brain development off the tracks.

**Extend your learning in TRY IT!** through two additional videos that offer brain-builder tips. The first offers five ways to enhance serve-and-return interactions, and the second provides insight on how we can help to bolster resilience in children.



Here are the **important ideas** this resource offers:

### Video #1 – The Science of Early Development

- Many areas of research show that our experiences even before birth (i.e., prenatally) and on into the first three years of life shape our ability to learn, and our physical and mental health.
- The brain develops from the bottom up – basic circuits that help us with basic skills develop first. More complex circuits that enable us to do more complex things develop as we get older.
- Our brains come biologically ready and expecting to learn through experience. The quality of our experiences of the caregiving relationship is the foundation.
- We develop through a combination of genetics and our initial experiences with caregiving adults.
- “Serve and return” is the term for back and forth interactions young children have with adults. This establishes a child’s social and emotional development and future learning.
- The brain’s different areas will be better connected to one another with supportive serve and return.
- Stress can get in the way of the brain’s ability to be interconnected – cognitive development (i.e., a child’s ability to think, explore, and figure things out) is dependent upon social and emotional development.
- The circuitry of the brain builds through experiences, where new experiences build on previous experiences.
- Stress has three levels – positive, tolerable, and toxic.
  - Positive stress is the body experiencing brief, temporary stress.
  - Tolerable stress is when the body experiencing serious stress, but it is buffered by positive relationships.
  - Toxic stress is experiencing serious prolonged stress without the protection of a positive relationship.

- Early exposure to toxic stress increases the likelihood of learning, emotional and physical problems throughout life.
- Brains are more flexible in the early years, which is why early childhood education is so important!

### Video #2 – Core Story: Experiences Build Brain Architecture

- Experiences shape the brain's development.
- Genes give the brain its **potential**, or the blueprint, for development. Experiences shape the **process** of how it develops. This will affect future learning, behavior, and physical health.
- Circuits and neural connections or pathways grow and develop rapidly the first three years – the more they are used, the stronger the pathway
- Experiences and environment tells the brain which connections to make, and which connections to let fade away.
- Strong connections help the brain to connect to its different areas. The areas are separate but are interconnected – one area depends upon the other to function properly.

### Video #3 – Core Story: Serve & Return Interaction Shapes Brain Circuitry

- Serve and return is key to the brain's circuitry and how connections develop.
- Young children instinctively serve through babbling, facial expressions, and gestures.
- Adults return babies' behavior by providing direct and meaningful responses to the child.
- Supportive interactions support the brain's development. When a child's "serve" isn't responded to, the connection begins to fade.
- Consistent and supportive responses to a child's efforts for interaction build the brain's foundation for all the learning, behavior, and health to come.

### Video #4 - Core Story: Toxic Stress Derails Healthy Development

- Learning to deal with stress is a part of healthy development.

- The body's stress system is activated when experiencing stress.
- Supportive interactions help the stress response system to return to normal. Without this, the response system stays activated.
- When the response system stays activated for long periods of time, the body and brain are exposed to harmful stress hormone levels. This is toxic stress.
- Without help to turn off the stress, the stress response system learns to stay on high alert.
- Being on high alert all the time weakens important areas of brain's circuitry and its ability to be interconnected.
- Toxic stress can be avoided if we makes sure that children's environments are stable, nurturing, and engaging.



## RECALL IT

Let's see what you learned from this resource! **Choose the answer from choices provided. The answers are at the end the guide.**

1. Healthy brain development impacts our mental health, our physical health, and all our \_\_\_\_\_ over the course of a lifetime.  
a) friendships            b) employment    c) experiences        d) learning
2. The three areas of stress are positive, tolerable and \_\_\_\_\_ stress.  
a) intolerable            b) negative        c) toxic                d) activating
3. The brain's blueprint, or potential for development, is determined through:  
a) experiences            b) birth weight    c) genetics            d) stress
4. The process through which the brain is shaped is determined through:  
a) birth weight            b) genetics        c) stress                d) experiences
5. Strong connections in the brain are made through the process known as:

- a) Serve and return    b) pruning    c) positive stress    d) stress response system

6. Engaging, nurturing and stable relationships protect brains from the impact of:

- a) exposure to violence    b) poverty    c) parental substance abuse    d) all



## THINK ABOUT IT

Take a few minutes to consider these questions. If you want to, write your thoughts down.

1. What information in these four videos was surprising or new to you? Has this new information changed anything in how you think about the development of the children in your care? If so, what? Will it impact how you respond to the children in your care? Why or why not?
2. Think about what we learned from these videos about how stress impacts the brain and how the brain needs to be interconnected for learning and behavior to be supported. Now think about when a young child shows you a challenging behavior and your response to it. Has anything in your thinking changed? If so, what changed?



## TRY IT!

Here are some ideas to try:

- Would you like to learn ideas on how to build supportive responses to young children, based on their age? Look **Handout #1 - One on One Time**,
- This resource talks about warm and responsive interactions with children. These responsive interactions are also known as “serve and return.” Watch the [5 Steps for Brain Building Serve and Return](#) video on serve and return to see what it looks like and how to do it yourself!

- Do you have concerns about the level of toxic stress children in your care may be experiencing? You should know that YOU are a big protective factor! Watch this video (2:22 minutes) on [What is Resilience](#), also from the Center on the Developing Child at Harvard (2015). It will share how we and the relationships we have with children can help buffer and protect them from toxic stress so they do more than survive – they can thrive!

RECALL IT! Answers: 1 - D, 2 - C, 3 - C, 4 - D, 5 - A, 6 - D