

## CHAPTER 3

# How Movement Helps Unlock the Brain for Learning

Freeing the body for movement unlocks the brain for learning. We'll talk about that how that works in a bit. But first, we'll take a look at some brain basics, because as the brain goes, so goes learning.

Neuroscience is a fascinating, complicated subject and one where the experts will tell you we still have much to learn. Still, let's review some fundamental science relevant to our understanding of how children grow and learn.

## Some Brain Basics

Different centers in the brain handle different major functions. In the early years of life, those centers learn to work together in harmony to create what we experience as human thought, feeling, movement, and expression. And broadly, that brain development happens from the bottom up. So let's take it from the bottom.



## The Brain Stem: Survival

The brain stem is on constant alert to matters of our survival, managing functions such as breathing, heart rate, digestion, and so on. It works behind the scenes without conscious thought most of the time. But whenever the brain senses danger or stress, real or imagined, it directs energy into the brain stem for immediate action. It's that snap-to-attention moment when we sense something is amiss, such as a strange sound or an unexpected event. When that happens, the lower parts of the brain take over, and in extreme cases, can all but shut down other parts of the brain until the situation is resolved.

This is one of the reasons why when a child is upset, it's nearly impossible to reason with her.<sup>4</sup> And while understanding this may not solve the crisis any sooner, it should make it easier for you to see it for what it really is (and keep you calm in the process).

## The Senses: Perception

The senses gather information the brain needs to understand and navigate the world. In fact, sensory perceptions are so important to our everyday functioning that all parts of the brain and some parts of the nervous system are involved in processing the information.

In early childhood, the brain is so hungry for information, you can see the senses in action all day, every day—and especially in the things that encourage children to move.

So for our purposes, even though sensory processing doesn't reside in any one place in the brain, we consider the senses a part of brain structure in the "Brain Basics" diagram.<sup>5</sup> We'll discuss this more in Chapter 5.

## The Cerebellum: Moving

The cerebellum is command central for most physical movement and muscle control, while playing a supporting role in some cognitive functions. Think of it as the part of the brain that learns how to move every muscle, then stores that information—muscle memory—for future use.

The learning that happens in the cerebellum is often why children love to do the same game over and over. Repetition helps the brain learn to move the muscles automatically—one of the brain's biggest priorities in the early years.

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## The Limbic System: Feeling

The limbic system manages our emotional lives. It houses emotional memories, builds impressions of our experiences, and influences our day-to-day reactions. In other words, the limbic system determines behavior.

This region of the brain is immature in young children, so their emotional reactions tend to be black-and-white. That's why broccoli may send a child screaming from the room or why he attaches to a favorite toy and won't let go! Emotional memory is powerful stuff—in both children and adults.

## The Cortex: Thinking

The most complex part of the brain, the cortex directs what we consider higher-level human thought, including:

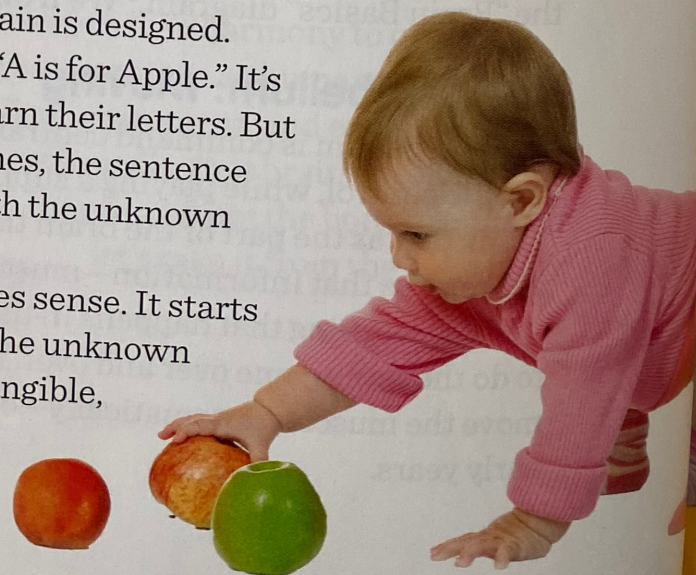
- Imagination and creation—the ability to develop a new idea
- Projection and prediction—the ability to forecast the consequences of different choices, such as stepping off a curb before the light turns green or mixing blue and yellow paint
- Interpretation of symbols—the ability to understand and use symbols, such as letters and numbers, for formal learning pursuits like reading, writing, mathematics, and science

## Apple Is for A

Quite often, our modern idea of early learning gets whittled down to that last point: learning letters and numbers. But a young child's brain is concerned with developing the whole child—not just the future student. Early childhood learning is a process of compiling tangible, physical, real-life, in-the-moment experiences one on top of the next. And the reason is simple. All learning, at any age, stands on the shoulders of prior knowledge—from the known to the unknown. That's how the brain is designed.

For instance, consider the old saying "A is for Apple." It's shorthand for describing how children learn their letters. But in fact, it's not correct. You see, for little ones, the sentence is backward and meaningless. It starts with the unknown instead of the known.

For kids, "Apple is for A" is what makes sense. It starts with the known (Apple) and relates it to the unknown (A). It moves from the tangible to the intangible, from the concrete to the symbolic. And that's how children learn.



## Brain Basics

### Cortex

Formal learning  
Abstract thinking  
Symbolic understanding  
Consequential thinking

### Limbic System

Emotional engagement  
Understanding and interpreting emotional messages  
(including body language)

### Cerebellum

Muscle control  
Muscle memory  
Motor skills  
Fundamental movement patterns

### Senses

Seeing  
Hearing  
Smelling  
Tasting  
Touching  
Balance (Vestibular)  
Intuition (Proprioception)

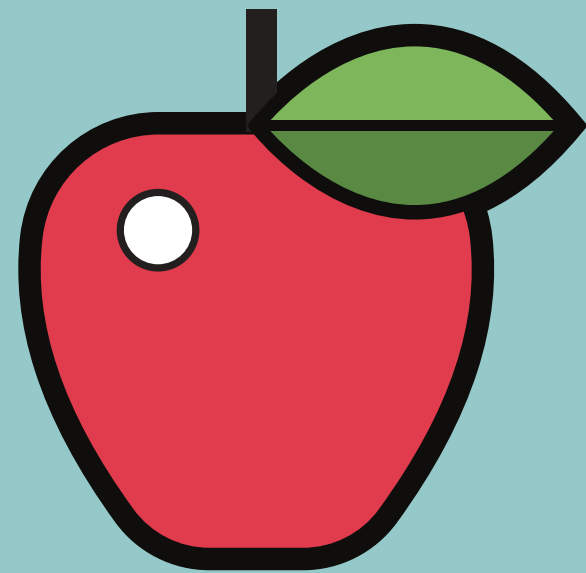
### Brain Stem

Survival  
Breathing, digestion, blood pressure  
Primitive reflexes<sup>3</sup>



# APPLE IS FOR A

WHY FLASHCARDS AND WORKSHEETS  
ARE NOT APPROPRIATE FORMS OF  
LEARNING



- Quite often, our modern idea of early childhood gets whittled down to the last point: learning letters and numbers
- But a young child's brain is concerned with developing the whole child, not just the future child – **being not just becoming**
- Early childhood learning is a process of compiling multi-sensory, tangible, physical, real-life, in-the-moment experiences
- All learning stands on the shoulders of prior knowledge – from the known to the unknown

# APPLE IS FOR A



- For instance, consider the old saying "A is for Apple". It's shorthand for how children learn their letters
- But in fact, it's not correct because it starts with the unknown to the known
- For children, "Apple is A" is what actually makes sense
- It starts with the known (Apple) to the unknown (A)
- It moves from the tangible and intangible, from the concrete to the symbolic
- And that's how children learn...

Through interactive, real life experience