

Mind *Brain* Ed Think Tank+

# CHILDREN

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# Mind*Brain*Ed Think Tank+

## Exploring the Wonders of the Early Language Learner's Brain

Start here:

MAIN

Brain Matters documentary – [Early Childhood Development](#)

LITE

Mooncake English – [ESL Lesson Plan Template for Young Learners](#)



### In this issue:

This *Think Tank* looks at teaching language to early learners, learners at an age where some of the most fantastic things are happening in the brain and yet these processes are little known to most educators. The **Main** video gives a comprehensive view of brain development in the first few years, while the **Lite** video offers tips for teaching English to children. **Mohammad Khari** summarizes these videos and pulls some of the key points out of each.

Brain expert **Julia Volkman** starts the Think Tank off with the Montessori approach to teaching language, and **Curtis Kelly** discusses the role early childhood education plays in developing character. Then, we turn to **practitioners** for rules of thumb they have developed for teaching children. After that, **Robert S. Murphy** informs us about the benefits of verbal interaction with children that he learned from Harvard's Catherine Snow, and **Skye Playsted** relates how a young student with learning difficulties led her to Barbara Arrowsmith-Young's work. **Ai Murphy** closes the Think Tank off with a brain-based lesson on healthy eating for children.

In the *Plus*, we have a story from **Tim Murphey** about a security guard full of heart.

Our cover: "*Anyone who does anything to help a child is a hero to me.*" — Fred Rogers

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# CHILDREN

## Children: The videos

Click the titles

### An Earnest Investment

Mohammad Khari outlines some pivotal concepts presented in the lead-in videos to point out the importance of the early stages of building the brain!



## The Think Tank

### A Scientific Approach to Early Language Learning

Julia Volkman boils literacy instruction down to five simple steps for humans of all ages.



### The Hidden Role of the Teachers of Young Learners

Curtis Kelly shows how early education plays a far more important role in all our lives than we think.



### Theory to Practice: Rules of Thumb for Teaching Children

An international panel of practitioners gives us bits of wisdom about teaching kids.





## Surprise! Dr. Snow’s Provocative Views and Advice Regarding the “30-Million-Word Gap”



Robert S. Murphy reports on Dr. Catherine Snow’s online course at Harvard. She taught participants to turn things upside down for more efficient YL learning.

## The Unique Language of a Child with Learning Difficulties



Skye Playsted encourages teachers to look into some of Barbara Arrowsmith-Young’s research to gain a new perspective on teaching children with diverse needs.

## Lesson Plan: “Foods of the Rainbow”—Not the Brown Palette!



Ai Murphy shares a well-oiled lesson plan for teaching children how to have fun while keeping the brain healthy—with optimal food choices!

## Plus

## Relating Deeply: Security Guards & Goddesses



Tim Murphey honors the unseen people on campus who should be seen more.





## THINK TANK: CHILDREN

Written by: Mohammad Khari

# An Earnest Investment

*"Your brain only gets built once."* —Linda Richter

Children are without a doubt fascinating in many aspects. They possess many unique features that make teaching them crucial, tricky, and rewarding: their amazing ability to enjoy mundane tasks repeatedly, their never-ending curiosity, and the fact that they are always busy with a task can teach adults a thing or two about life. Children are blessed with some amazing physiological characteristics as well: they make more than 1,000,000 neural connections in a second and at age 3-6 months, they can discriminate all the sounds of all languages of the entire world!

The factors leading to successful child development have been long investigated. Fate, money, intelligence, luck, hard work, genetics, and education are among the most famous ones labeled by different groups working in this field from different perspectives. The one thing they all agree on is that the early stages are crucial in laying the foundation right and, as [science](#) confirms, we start learning before we are even born!

In this issue's main video [Early Childhood Development](#), we learn how important frequent, intentional, and individualized interactions between adults and children are in forming high-quality relationships. This rich documentary also delves deeply into the simple yet amazing idea that "all babies, no matter where they are born, come ready to learn."



Touching upon some projects focused on Early Childhood Development (ECD) all around the world, notably [The Abecedarian Project](#), this documentary advocates the

benefits of scientific studies and experiments like [The Still Face Experiment](#) (conducted by Edward Z. Tronick) and [The Marshmallow Test](#) (Walter Mischel) in the study of children’s development, boiling it all down to the life-changing concept that “the brain has to be built.”



Four brain-boosting experiences help children be better prepared for school and for life: a nurturing responsive parent or caregiver, a rich linguistic environment, play that promotes learning, and good nutrition. *Early Childhood Development* explains how interactions, connection, and reconnections are important in children's development and why “real conversation with real people is educational.” It also explores the roles of languages and symbols, music, self-regulation, and meditation in leading a child down the path to better jobs and lower criminal activity.

In our lite video [ESL Lesson Plan Template for Young Learners](#), Gemma Perry highlights the importance of setting clear, simple, and achievable goals in lesson planning while keeping an eye on your students’ profile, their level and age, and the subject you are teaching, in order to keep your young learners engaged. She dissects each lesson into four logically designed stages of warm-up (for both grabbing their attention and reviewing purposes), introduction, practice, and dismissal. She also points out that lesson plans for young learners should include simplified instructions, logical links, and a proper pace.

As mentioned in the main video, “brains are built bottom-up,” that is why the education children receive plays a significant role in their future and it is considered a solid investment to allocate resources to ensure that these “experience expectant” brains fulfill their true potentials. After all, the whole challenging and crucial stage of early childhood development is anything but child’s play!

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## THINK TANK: CHILDREN

Written by: Julia Volkman, ALM, AMI (3 to 6+)

# A Scientific Approach to Early Language Learning

My daughter read her first word on her third birthday. My family was amazed. We thought we had a true genius on our hands. But when I visited her Montessori preschool, I discovered the truth—in Montessori school, they explicitly teach you how to read as soon as you're interested in it. Not to say that my daughter isn't a genius (she's amazing), but she was not the only 3-year-old in her class who was happily sounding out words. How could that even be possible?

In traditional preschool/kindergarten, a lot of time is spent on learning the alphabet and building a child's love of books, reading, stories, songs, and language as a whole. Despite this, the children in Montessori schools show an academic advantage over children in non-Montessori schools during the preschool years (Lillard et al., 2017). So, what exactly is going on in Montessori preschools? Are they chaining children to desks and forcing them to memorize sight words?



As it turns out, the term “Montessori” actually just means scientific pedagogy. It's not a guru model, it's a scientific model. Montessori preschools do all the literacy building things that traditional preschools do but they also explicitly teach children about the parts of a language and how those parts work together to make words and sentences. I learned this approach in Montessori teacher school and used it for years in my own classroom and in the classrooms I mentored. However, it wasn't until graduate school at Harvard

that I discovered that there is a boatload of research to back it up.



This article will boil the scientific approach to language instruction down to five key concepts: (1) vocabulary development; (2) phonemic awareness; (3) letter-sound knowledge; (4) writing (constructing words); and (5) reading (sounding out words). As you read, remember that no skills develop along a strictly linear path (Fischer & Yan, 2018). So, these steps are happening in order, simultaneously, and in reverse all at the same time. Thus, scientific pedagogy marries explicit, dynamic, and individualized educational approaches.

## Step 1: Surround the child with a rich language environment



There are some things children are naturally programmed to do, like learning to speak, take their first steps, or grow their teeth. These events are natural, biologically programmed, right? Yes, but, while our teeth will grow in even if we never visit a dentist, some of our biological changes depend on experience (Greenough et al., 1987). So, if an infant never opens their eyes, their visual cortex will not develop. Likewise, if a child never hears language, they won't develop one. This leads us to the first key point; we must offer children an environment dripping with all the beauty our language has to offer.

The research world became acutely aware of the importance of oral language when Hart & Risley published their groundbreaking work in 1995. Their research found a connection between a child's vocabulary exposure/knowledge at early ages and their IQ at older ages. While there is lively debate on the validity of those conclusions (Sperry et al., 2019), the overall need to engage children in their language(s) is well-supported (Anderson et al., 2021).



A young child will learn any language and as many languages as people around them speak. Think about that for a moment. No one actually sits down and gives the child a language lesson; they just “get it.” What kind of miracle is happening in the brain in those early years that lets this happen? This is the result, primarily of the effortless brain plasticity that happens in the early years (Center on the Developing Child, n.d.). We older humans can still learn languages (at any age), but we have to put in a lot more work to do so.

So, if it is easier for young children to learn, at what age should we start giving them explicit language lessons? Research shows us that trying to pin things down to a specific age is actually not that helpful (see Bailey, 2002 for an overview of critical periods and early education). Instead, as the Montessori approach suggests, we should start explicit language lessons early and then let the interests and abilities of the child guide how we proceed. When they are interested, we pounce!



Right from birth, children are drawn to language and music. We use words and songs to engage, soothe, celebrate, and play. This part is simple; simply offer the children what they seek. Sing, chat, dance, play, and talk. Tell them stories about your life and ask them about theirs (Anderson et al., 2021). Remember to always steer these interactions towards the positive. Don’t focus on all the trouble in your life or the world. We are trying to overcome our natural negativity bias (Rozin & Royzman, 2001), so keep your stories on the cheerful side! If you’d like inspiration and specific directions, I’ve written several [blog posts about spoken language activities](#) to do with young children. The key is to get them talking and interested in language.

Beyond conversing, singing, playing rhyming games and the like, we can actually give specific vocabulary lessons even at very young ages. The 19th century psychiatrist Édouard Séguin developed a very effective means of doing so. His approach was adapted by Dr. Maria Montessori and eventually became known as the three-period lesson:

**Period 1:** The teacher names the object (e.g., This is a leaf, This is a book, This is a spoon) and encourages the child to repeat the name

**Period 2:** The teacher asks the student to recognize the vocabulary (e.g., Show me the leaf, Show me the book, ...)

**Period 3:** The teacher asks the student to produce the vocabulary (e.g., What is this?)



*[Click to watch a video presentation of the 3-period lesson from Voila Montessori](#)*

Use the three-period lesson for everything from household objects to scientific taxonomy. When you do so, keep in mind that most of the learning actually happens during the second period, when the learner is working with recognizing the vocabulary. With young children, you can have a lot of fun in period two. Say, “Pick up the leaf. Put the spoon on the table. Put the book on your head,” etc. Keep this lively, fun, and short (leave them wanting more). Most importantly, don’t move to the third period until you’re 99% sure they know the vocabulary! You don’t want them to fail. Moving students ahead before they are ready may be one of the factors that contributes to the decline in self-efficacy seen in children as they go through traditional school (Schunk & Pajares, 2001).

Don’t confuse the three-period lesson with the Presentation, Practice, Production (PPP) model of teaching (Anderson, 2017). The three-period lesson is offering explicit lessons on specific vocabulary to one or a few children at a time; this is not a whole group activity and it is only a small part of the scientific approach to language development. It is not trying to be the whole shebang, like PPP is. The three-period lesson gives us an explicit way to “teach” the young child vocabulary, but the overall need to maintain a rich language environment doesn’t end; the language we immerse them in is the foundation, the starting point, and the field upon which all future games are held. From here, we can provide instruction on the mechanics of literacy.

## Step 2: Play sound games to develop phonemic awareness

Somewhere around ages two and three (see how I'm not being too precise here?) the children will start to really like playing sound games. Playing *I Spy* is a great example. Here's how to play. Gather some objects from the room (encourage the children to choose them) and name each one as you put it on your work area (the children should know the vocabulary for each object before playing). Then say, "I spy with my little eye, something on the rug that starts with the sound 'zzzzz.'" If they can't find it, touch the object, or give them other hints until that they succeed.



Once the child has some success with beginning sounds, add in the ending sounds. Say, "I spy with my little eye something that starts with the sound 'mmm' and ends with the sound 'guh'" (we're talking about a mug). When they're good with those two sounds combined together, add in the middle sound. "I'm thinking of something on our rug that starts with the sound 'llll,' ends with the sound 'kuh,' and has the middle sound 'o'" (for lock). Once they're successful with this stage, you can ask them to start segmenting all the sounds within a word. A child's vocabulary knowledge has a direct relationship with their success in segmenting words (Ouellette & Haley, 2013). So, you can see how we are looping back to step one if we want to succeed in step two. Segmenting is also foundational for step four, being able to put letters together to build words. Are you getting dizzy yet? Just remember that it is all intertwined!



*I Spy* and other games help children isolate the sounds (also called phonemes) in the language. In the world of literacy research, that's called phonemic awareness and it is a key factor in developing literacy (Byrne & Fielding-Barnsley, 1989). When you're learning a new language, the need to isolate the sounds in words becomes obvious. We often speak words quickly without stressing all of the sounds in each word. So, taking time to articulate slowly, carefully, and with rhythmic curiosity can be quite helpful (Haake et al., 2014). The goal here is to draw the child's attention to syllables, rhymes, and individual phonemes.

You'll notice that the *I Spy* game is not played by standing in front of a room while the children are at desks. If you've ever tried to get a group of 3-year-olds to do anything at the same time, you discover that it is a task similar to herding cats. If you insist upon it, there will be tears, meltdowns, and rapid dashes across the room. Instead, almost everything with the young child is done one-on-one or in small groups that they are somehow enticed to join (the art of inspiring children to eagerly join your lessons is a subject for another article).

### Step 3: Develop letter-sound knowledge

With phonemic awareness underway, it's time to start working on the symbols within the language. In an alphabetic language like English, that means learning the symbols that make up the sounds (phonemes) in our language. Phonemes can be created by one letter (like mmmm) or more (like th or sh). When more than one letter is put together to make a new sound, it's called a phonogram or digraph. When children have good letter knowledge, they are more likely to become strong readers (Shanahan & Lonigan, 2010; Share et al., 1984). Letter knowledge does not strictly develop after children have phonemic awareness. In fact, letter knowledge and phonemic awareness may develop at the same time (Foy & Mann, 2006). So, dive into letter work as soon as children understand how to play *I Spy*.

You may have already witnessed the young child's desire to touch absolutely everything, ... good, bad, and disgusting. We can take advantage of this tactile curiosity by offering them letters that are designed to be touched. The Montessori pedagogy uses letters cut out of sandpaper and pasted up on smooth boards; these are called the sandpaper letters.



The overall approach is to show the child how to trace a letter and say its sound (not its name). We introduce three letters at a time; phonograms are introduced at the same time as consonants and vowels. Then, we use the three-period lesson to play games while mastering the letter-sound connection. That's it. Easy-peasy-lemon-squeezy. (If you'd like more information, you can read detailed instructions about [presenting the sandpaper letters](#) on my pedagogy blog.)

## Step 4: Start making words (writing)

Once a person knows some oral vocabulary, can hear the sounds in those words, and knows most of the sounds that the symbols of our language make, s/he is ready to start building words. This is a very constructivist approach to literacy. It allows us to apply ourselves so that we can master our developing knowledge.

With the young child, holding a pencil and forming legible letters is likely asking too much. It's even too much for an adult learning new symbology! Instead, we use a movable alphabet.



*Using the movable alphabet to write words ©Maitri Learning. Used with permission.*

The alphabet does two main things. First, it frees us from the pencil or pen if our hand is not yet able to succeed with those tools. Second, and most importantly, it provides a memory scaffold. We don't have to imagine all the possible letters we are studying; we can see them right in front of us. Because there is a limited selection from which to choose, we have a greater chance of success. [My graduate research at](#)

[Harvard](#) actually looked at this specific question and found that preschoolers could phonetically spell more words when using a movable alphabet than when using a pencil (Volkman, 2017). So, break out the movable letters!

When guiding the child to write words, however, you can't just give them a list. This is boring beyond belief and the child will never want to repeat the work on their own. Instead, you give them the freedom, inspiration, and power to communicate *their ideas* to someone else even if they are not in the same room with them! This is the magic of writing. We aren't giving them exercises, we're giving them power. So, find what matters to your students and guide them to write about that.

Oh, and about spelling, you should totally let it go at this stage. First, we are just encouraging them to understand that they have the capacity to build words using these remarkable things called letters. Later, as their abilities/confidence grow and as they start to read, they will naturally become interested in refining their spelling.

You can read more about [using the movable alphabet](#) on my pedagogy blog.

## Step 5: Read, one word at a time



Believe it or not, the ability to write in the way described above, actually develops before the ability to read. This intuitively makes sense—I mean, it is easier to build a code than to crack one, right? Once the child gains experience with writing, reading will naturally just happen.



At some point, you'll see the child trying to sound out words. This is the moment to introduce them to their first reading activity. Again, we want to think about scaffolds to make sure the child will succeed. So, we prepare a little collection of objects or photos that are spelled phonetically (like cap, mop, clip). We bring those objects and several slips of paper to a table. Then, we say, "I'm going to write the name of one of these objects and you have to figure out which one I want!" Write the word and let the child sound it out (help if they need it) and place it next to the object you have in mind. Once they get the taste of this, they are going to want more and more words so be prepared! You are opening the Pandora's box of reading.

After some time working with individual words, you can move on to phrases and little books. Keep progressing at the child's pace, not too fast, not too slow. You want to keep the challenge just matched with their growing abilities.



So, as a review, the five big steps leading to literacy are:

1. **Spoken Language:** create an internal dictionary and practice using the words in it
2. **Phonemic Awareness:** learn to hear the sounds within words
3. **Letter-Sound Knowledge:** Learn the symbols of an alphabetic language and the sounds that each makes
4. **Creating Words (Writing):** learn to put those sounds/symbols together to make words
5. **Reading:** Learn to decode those sounds/symbols to decipher words

This sounds entirely too straightforward, right? Yes and no. These steps do not necessarily proceed in a neat, tidy order from one to the next. There is usually a lot of overlap as learners dynamically develop their web of knowledge. The teacher's role is to follow and simultaneously inspire the student's interests and abilities so we can hop in and out of these steps as needed. We have to master teaching each step so that we can easily pull the right activity out of our toolbox when the moment is ripe.

What underlies all of this is our ability to observe our students without judgment: scientific observation. We need to accurately see their growing abilities and interests, even if we don't like what we see! Have they really mastered the ability to segment sounds or are we rushing them because we're tired of playing *I Spy* games? Do they know enough letter sounds to try writing or are we pushing them too soon because their parents/the administration is pushing us? Do we have a deep enough relationship with them to know what they would actually want to write about?

This need to know our students (by practicing scientific observation) is what sets this approach apart from all others. The scientific approach does not prescribe a one-size-fits-all solution. Instead, it is inherently an individualized approach. It has to be, because human variability is normal and to be expected. (If this topic intrigues you, check out Todd Rose's TedX talk on [the myth of average](#)).

So, I dare you to try this method not only with children but with adults as well. Don't just assume that it will work, prove it! If you hit bumps along the road, put on your observation hat and learn more about your students. Then, revisit the steps the child needs and, above all, be patient. We cannot force a child to read any more than we can force them to take their first steps. We can only create the causes and conditions that prepare them to discover that they can read. Then, we sit back and let our hearts melt as another soul falls in love with the written word.

Good luck and I hope this helps!

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## THINK TANK: CHILDREN

Written by: Curtis Kelly

# The Hidden Role of Teachers of Young Learners

I am going to say something drastic: Of all teachers, those that teach young learners are, by far, the most important. They have the potential *to save the world*.

This is not a statement I came up with. It came from some economists who produced a National Public Radio Planet Money [podcast](#) with the title: *Why Preschool Can Save the World*. Economists? Preschool? Save the World? Trust me, it all connects. This podcast had a huge effect on me. Repeated listens set me on a path of researching this intriguing claim and exploring the cognitive development of early learners. I dove into reading about the all-important executive functions centered in the pre-frontal cortex, and how they become the foundation stones for all the skills we need in life, especially those related to [character](#), such as honesty, cleanliness, and tolerance. Teachers at every level have an impact on the development of executive functions but, as those economists and I will show you, it is the preschool and elementary school teachers who have the greatest impact.

To my surprise, what I learned turned out to be important in my personal life as well. When I began that research, I was raising a young daughter and we had to figure out whether to put our savings into sending her to a private preschool and elementary school, a private junior and senior high school, or a private college. The best schools where I live are private, and we only had enough money to send her to private schools for one of



these periods of education, not all three. We decided to focus on her early education and, as we now know, that was the right choice.

Why will become clearer as you continue on. Let's start with two questions: how important is character for success, and to what degree can we teach character skills to our learners?

I should point out that by “character,” I am using the word as in common parlance, meaning how honest a person is, or tolerant, responsible, and so on. Psychology defines personality and character in a slightly different way, as being certain fixed “traits,” separate from “skills.” Since work on character and personality was mainly done between the 1930s and 1970s, in the heyday of genetic determinism and the “hard-wired” brain, it is not surprising that traits were viewed as more or less fixed and supposedly genetic. On the other hand, we have now [abandoned the view](#) of the brain as being hard-wired, and have come to understand that it is [nature and nurture](#) that makes someone who they are, not one or the other. These changes in perspective, and [studies](#) that show traits can change over time, have started to weaken the traditional view that traits are fixed. In the spirit of neuroplasticity, I will intentionally blur the lines between traits and skills, and between fixed and changeable.

## How important is character and can it be taught?

Here is where the first economist comes in, the amazing Nobel Laureate, James



Heckman. He points his research engines at interesting issues, such as how well IQ predicts college success; important things that that IQ tests do not measure, such as soft skills; and whether universal pre-K education is worth spending money on ([It is!](#)).

Heckman has convincing evidence from his studies that it is the soft skills that determine success in school and life, not IQ ([GED study](#)) or even parental income levels ([job training study](#)). Soft skills are

connected to the [Big Five personality traits](#), and of the Five, there is one that stands out in relation to success: conscientiousness. Conscientiousness is [almost synonymous](#) with “Grit,” a more recent term popularized by [Angela Duckworth’s Ted Talk](#). Whichever term you prefer, as Heckman shows us, it is that ability to take on a

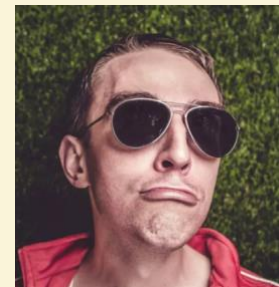
responsibility and stick to it that determines whether a young person will succeed in college, or do well at a job. So, character matters. Intelligence pales in comparison.

But can this conscientiousness be taught? We tend to believe that whether someone is diligent and dependable or not is pretty much permanent, and there is not much you can do about it. And that is probably right, as Heckman's [GED study](#) found. Smart kids who had dropped out of high school and were given another chance to get a diploma through the GED test and go to college, tended to drop out of college as well! These high school dropouts who got the GED diploma were shown to have higher IQs than the other high school dropouts, but that did not matter. They shared the same lack of discipline and failed at staying in college.

And more. Those same GED recipients were less likely to stay with a job, stay with a spouse, and far less likely to stay *out* of prison (see [charts](#) in [Heckman & Kautz, 2012](#)).

Inadvertently, a test has been created that separates out bright but nonpersistent and undisciplined dropouts from other dropouts. It is, then, no surprise that GED recipients are the ones who drop out of school, fail to complete college...GED's are "wise guys," who lack the abilities to think ahead, to persist in tasks, or to adapt to their environments. (p. 146)

A friend of mine always says, "People don't change, and it is foolish to think they will," which reflects the sentiment that character cannot much be taught...at least to adults. But what about to children? Here the evidence is strong that it can be. And who was one of the people who made this discovery? James Heckman!



Heckman also studied the [Ypsilanti Perry Preschool Program](#), where disadvantaged 3-4 year-old African American children were given an early education. That short experience alone had effects that lasted into adulthood, including better outcomes in "education, employment, earnings, marriage,

participation in healthy behaviors, and reduced participation in crime" ([Heckman et al., 2012, p. 2](#)).



Remember my comment earlier that we will blur the line between skills and traits and we will not assume that traits are fixed? Because of the Perry program, Heckman came to that conclusion, too. In regard to soft skills, he wrote: “Personality traits can be changed by intervention, and interventions that target personality are promising” ([Heckman, 2013, p. 1](#)),

Another project, the [Abecedarian Early Intervention Project](#) in North Carolina, showed much the same. In the seventies, 54 infants born to poor families were given care from infancy to age 5, mainly playing educational games. The researchers measured a jump in IQ compared to the control group but, to their surprise, other changes (more in tune with modern thinking than IQ scores) showed up much later. Follow-up studies showed that at age 21, the treated group had higher reading and math scores; at 30, they were more likely to have a college degree; and at age 35, better overall health: less obesity, heart disease, and hypertension ([source](#)). And the good news goes on. Just two weeks ago, another study came out, in which MRI brain scans showed that those in the treatment group, especially the males, “had increased size of the whole brain, including the cortex” and better development in the areas related to language and cognitive control ([Virginia Tech, 2021, p.1](#)). All this, *50 years later*, and probably because of a couple years of preschool!



Let me quote Alex Blumberg (also an economist) who neatly sums up what this means in another Planet Money podcast, [Preschool: The Best Job-Training Program](#) (again based on Heckman’s work). Watching toddlers playing with blocks and interacting with caregivers, he notes:

If they learn these [soft] skills now, they'll have them for the rest of their lives. But research shows if they don't form these skills now, it becomes harder and harder the older they get. By the time they're in a job training program in their 20s, it's often too late.

So that's it, my friends. Character *can* be taught, but it must be instilled at an early age. And that is why preschool teachers are the most important. They truly have the potential to reduce crime, illness, and substance abuse. How odd that our topsy-turvy educational hierarchy, in terms of status and salary, has them at the bottom!

## Executive functions

So, preschool has a big effect, but you might be wondering why. The answer lies in looking at the development of executive functions. These are skills that are laid down in early childhood and become the foundation for almost every other mental skill that comes later, including reasoning, discipline, and emotional intelligence. If they are not properly established in children, then, as Blumberg said, they become harder and harder to develop later.

Adele Diamond (like Julia Volkman, also a proponent of Montessori), runs the [Developmental Cognitive Neuroscience Lab at the University of British Columbia](#), and she has done a lot of work defining executive functions. I have spent weeks rummaging through the many interesting and varied studies on her [website](#), but my favorites are the [ones on executive functions](#) and her stirring [TED Talk](#) on that topic.



Here are the three core executive functions and the skills they give rise to ([Diamond, 2016](#)):

<p><b>Inhibitory Control</b></p>	<p>inhibiting the impulse to respond or react immediately, resisting temptations, staying on task, holding out for two marshmallows</p>	<p>(related skills)  <b>Self-regulation</b>  <b>Teamwork</b>  <b>Conscientiousness, Grit</b></p>
<p><b>Working Memory</b></p>	<p>holding information in mind and working with it, as when you solve a math problem in your head</p>	<p><b>Reading</b>  <b>Reasoning</b>  <b>Sports, Scholarship</b></p>

<b>Cognitive Flexibility</b>	thinking out of the box, seeing other perspectives, flexibility, switching between tasks. (emerges later than the others)	<b>Tolerance</b> <b>Creativity</b> <b>Decision-making</b>
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## How to nurture executive functions

Doing so is not a matter of “teaching” executive functions as much as setting up an environment and activities that let children develop them on their own, while offering guidance and support. Children are preprogrammed to learn these skills if given the right conditions.

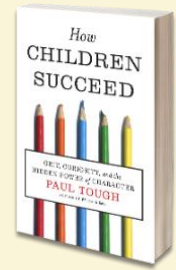
In fact, every article in this Think Tank is related to building good executive function: Julia Volkmann’s advice that we support natural development; Skye Playsted’s plea that we adapt to the learner rather than the other way around; Robert Murphy’s admonition that we foster quality interaction. And, as this [video](#) that Julia sent us shows, developing executive functions and other skills is “*The Child’s Work.*” Children are predisposed to seek out experiences that meet their developmental needs.



For more organized curricula that impact specific executive functions, see Diamond & Ling’s: “Conclusions about interventions, programs, and approaches for improving executive functions that appear justified and those that, despite much hype, do not” (2016), and other papers on [Diamond’s site](#).



For teachers of adolescents, I also highly recommend Paul Tough's *How Children Succeed: Grit, Curiosity, and the Hidden Power of Character* (2014). Or, look at Spacey's list of [character-building experiences](#) for learners (2020). After all, early education teachers might be the ones who get the ball rolling, but the rest of us play a role in saving the world, too.



*Curtis Kelly (EdD.) is a professor at Kansai University, a founder of the JALT Mind, Brain, and Education SIG, and producer of the MindBrainEd Think Tanks. He has written over 30 books and given over 500 presentations. His life mission is "to relieve the suffering of the classroom."*

# GOING DEEPER

*Curtis: This Annenberg [video](#), recommended to us by Robert Murphy, connects the ideas of brain development I discussed to Kurt Fisher's Dynamic Skills Theory.*

## Dynamic Skill Development

Neuroscientist Kurt Fischer discovered how, each time students advance to the next stage of mastery, there is a surge of growth of new neural networks in the brain.



Written by: the practitioners

## Theory to Practice: Rules of Thumb for Teaching Children

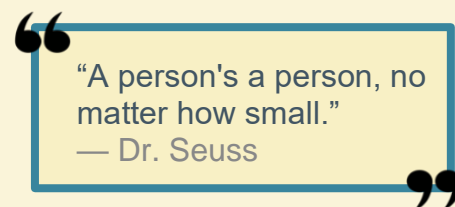
*Dear readers, the Think Tank Team has contacted some veteran teachers of children and asked them for rules of thumb or bits of advice for teaching children. Enjoy!*

### Kids know best



In our class of students with special needs, we have one little boy who regularly tries to run out of the classroom. The other students figured out that he loves hugs, and so when he tries to make a run for the door, they create a “hug chain” where they stretch out their arms and all take turns to hug him and encourage him back to his spot in the room.

*- Jamie Matthews teaches a class of children with diverse needs in an Australian primary school.*



### Isn't reading wonderful!



We can bring our students into a world they have never been in safely and foster curiosity that will last a lifetime. And we can do all of this for the price of a book. In this episode, we took a trip to a little boy's house and learned that not all things are as they seem. Not only was this a lesson with moral implications, but it was also fun to see someone else's house.

*- Dr. Grant Osterman runs a private international school in Okinawa and is the coordinator of the JALT Teaching Younger Learners SIG.*

## Start with the book



Base a 3-4 lesson plan around a popular children's book. The book has the effect of putting the vocabulary and activities in context.

For example, after reading *The Hungry Caterpillar*, leave it in view and use it as the base for follow-up lessons, such as: “days of the week,” (ball drills, board games, or matching/translation activities); learning “fruit” (drawing pictures, card games such as Slap or Pelmanism-Concentration); practicing the verb “to eat” (a writing worksheet along with common nouns to show how it is used in a basic sentence). Start of each lesson with a review of the book to establish context. These activities become meaningful because they are connected.

- *Chris Ziffo works as a lecturer at Nagoya University of Foreign Studies and has worked extensively with young learners in Japan's public schools.*

“If you want your children to be intelligent, read them fairy tales. If you want them to be more intelligent, read them more fairy tales.”  
— Albert Einstein

## Learn from the children



What I know about teaching language, I learned from all the young learners I have shared time with. They do not lecture me, yet they teach me what to do by being honest and throwing puzzles at me. Unlike my university students, children aged from 3 to 6 or 7, do not tolerate any boredom or laziness in their teacher. They brutally show whether or not the activities or books I use stimulate them. In addition, older students, 5th graders and above, show me how complex their minds really are and refuse any activities that may be beneath their intellectual capabilities. Facilitating an empowering learning environment for young learners requires wholehearted attention to their current mental and physical conditions. Their facial expressions and body language in class, as well as their needs and interests must always be taken into account. Therefore, designing lessons that fit the diverse personas and learning styles in young learners is a far greater challenge than designing lessons for students in higher education. It is also more joyful.



Oddly, without the brutal, yet inspiring, teacher training opportunities numerous children have provided me over nearly three decades of teaching them, I would feel lost in the classrooms at the universities where I now work.

- Chiyuki Yanase lectures at several universities in Tokyo, and was a school owner and ALT at various primary schools.

“The best inheritance a parent can give his children is a few minutes of his time each day.”  
— Orlando Aloysius Battista, chemist and author

## Honour children's stories

As educators, we need to deal with different kinds of complex behaviours of children—from extrovert to introvert, from aggressive to submissive, from attention-deficit to reluctant! What helps us deal with these behaviours with more empathy is to understand that: A child's behaviour is not always what it seems to be! The behaviour that's visible might be a manifestation of the stories that are suppressed inside the child. It's important to honour those individual stories that children carry with them into the space. It may even lead to positive behavior modification. Please refer to the [Iceberg Model](#) originated by Sigmund Freud for more details.



- Priyanka Chatterjee aka “Golpodidi” is an International Story Consultant, award-winning Storyteller and Educator from Kolkata, India who believes that: "The power to change our lives lies in changing our stories."

## Move it!

Back before English was added to the national curriculum for elementary schools, I used to teach English to Japanese country kids, aged 5-10. They were restless, nervous, wondering what in the world they were studying English for. (The real reason, in many cases, was that their urban, world-travelled mother married a farmer, and she didn't want her kids to end up where she did.) Sitting in a Saturday class never fit them. But there was one thing that did: taking them outside and doing [TPR](#) (Total Physical Response): "Find something with the letter 'A'" (on seeing that letter on a car license plate). Run to it!" "Take 3 steps, jump 5 times, and take 3 more steps." For these kids needing to run around after a week of school, it always worked like a charm! And they learned!



- *Curtis Kelly co-owned a countryside school for children and has set up special projects for various public elementary schools.*

“Adults are just outdated children.” — Dr. Seuss

## Early hacks

I have noticed an increasing emphasis on STEM education for children. This is an essential adaptation for our changing world, especially as we have moved to implement distance learning. Even kindergartens are introducing simple coding lessons in the format of puzzle games. The students are given a character and an objective, and it's up to them to choose the right code that will move the character to their endpoint. The students don't see it as learning a computer language; they see it as entertainment. I am a bit jealous that I never had these opportunities in school.

- *Brianna Cozenza specializes in childhood literacy and currently works as a lecturer at Nagoya University of Foreign Studies.*

## Teachers' secret helper

(click on video image to watch)

- *Barb Kelly is a child psychologist in Australia, experienced in providing psychological therapy to children and young people with developmental concerns and complex mental health issues.*



## Dramatic closure!

Try not to fall into the pattern of allowing portions of the lesson to just fizzle away as you move to the next teaching point. Remember, children pick up on emotional cues from the teacher—so if you create an exciting ending, your students will tend to be excited too, and retention rates will be higher. However, if you let a learning point just fade away, well, what a waste that would be! The students might feel that it wasn't important.

What can closure look like? Example A: Have a lively Q&A review combined with a climactic “Yay!” after the demonstration of learning; it is a celebration of learning.

Example B: Conduct *performance of understanding* sessions for validation. Ask students to think of a way to perform their new learning/understanding for the other students—and have them do it. This mixture of autonomy, the pressure of performing, and the genuine validation that comes from it is often a golden combination that not only raises retention rates, but also brings on deeper understanding and appreciation for the learned content.



- Robert S. Murphy: *Teaching children since the 1990s; conducts research in cognitive development.*

.....YAY!

“Children are the living messages we send to a time we will not see.”  
— John F. Kennedy





## THINK TANK: CHILDREN

Written by: Robert S. Murphy

### Surprise! Dr. Snow's Provocative Views and Advice Regarding the "30-Million-Word Gap"

Hart and Risley introduced the staggering "30-million-word gap" between children of different households, back in [1995](#). Some may call it a [famous study](#) while others may call it an [infamous study](#). This is because it has caused quite a stir directly and indirectly; the proposed solutions tended to sprout problems of their own. In their study, Hart and Risley followed parent-child language usage (listening/speaking opportunities) in a range of different contexts. The children in the most socially disadvantaged group produced only *half* the number of words that the children of the "professional" families did. Hart and Risley also noted that vocabulary size is a major predictor in future scholastic success and that the vocabulary size gap among young children quickly widens from a 2:1 ratio to a 4:1 ratio in a matter of months.



What was the cause of these tremendous gaps in vocabulary from such a young age? The [gist can be found here](#). The researchers realized that the significant predictor of this phenomenon was the *amount of time* the parents spent interacting with their children. Moreover, not only did the disadvantaged group’s children have less interaction with their parents, but even when they were interacting (such as during chores, etc.) there was less talk during that time—fewer words were being vocalized per hour. And so, by the age of four, there is a 30-million-word gap between the number of words heard by the children in the professional homes vs the disadvantaged homes.

The obvious quick fix is to have parents talk more with their children, right? *Wrong*—according to [Dr. Catherine Snow](#) (former Dean, Harvard Graduate School of Education). This article is my take on her brilliant insights and the proposals that she



put forth in a [course on this topic](#) that I had the opportunity to attend a couple of years ago. As such, all the following quotes from Snow are from her online course. She was provocative—these quotes are provided to give you a sense of how she worded her message.

In her online course, Dr. Snow argued that telling parents to talk more would be “missing the mark” and that it was not quite the solution that it seems to be. Why is that? Well, it’s primarily because parents are not sure *what* they should be talking about with their children. And so, they need guidance in this area. Moreover, Snow suggests that a keen focus on the gap of “30 million words” was counterproductive and that this issue should not be seen as a gap in heard vocabulary per se, but a gap in “access to knowledge.” What does she mean by that? An example would be a family gathering at the dinner table. In the *professional group’s* homes, the children were

“Telling parents to talk more would be “missing the mark.””

commonly more engaged in conversations that allowed them to acquire content along with new vocabulary—*the family asks mom... about her day, why police sirens are so loud, why steak is popular, where bananas grow*, etc. These were typical daily conversations in some of the households—but were non-existent in

many of the lower income households. Some adults may dismiss these conversations that are seemingly “talking about nothing” as a waste of time and energy, especially from the adult’s perspective. However, Snow argues that these questions are the key to accessing new words and new concepts in a timely fashion; the children gain concrete developmental foundations through this daily exchange, even when it may just seem like playful banter.

According to Snow, parents of young children are often given the advice, “speak more to your children—use more words,” but the better advice would be “find interesting things to talk about, and make sure that they get talked about in ways that engage children in those conversations.”

## The first two years of life...

Snow pointed to a number of important distinctions that seem to be easily glossed over if they are not explicitly reinforced in the minds of parents and teachers. That is—of course talking to the little toddlers is imperative, but there is a subtle difference between talking at the child and engaging with them. Because children create pre-language *proto-conversations* which are amusing but nonsensical to adults, it is common for adults to sort of force “correct” language usage on them at the time; this may be especially true of teachers. Why? One likely reason is that the babbling is often not an actual attempt at communication from the child. Snow puts it this way:

But by virtue of imitating the noises they make, by virtue of responding predictably to the gestures and facial expressions they produce, adults can recruit them very early into an interest in communication and interaction, and an attentional state in which they could learn from the adult language they hear. If the adults just talk all the time, that doesn't work very well... (in the more successful households) adults are very, very willing to interpret all attempts at communication as valid and worthy efforts at communication. They don't wait for children to produce clear words before they start interpreting the noises that children make.





So, engaging with children during the pre-language stage should not be essentially focused on portraying correct language usage from the teacher's perspective, but more on prepping the child for active social behavior. According to Snow, mimicking the child's babbling and gestures provides validity and it helps nurture curiosity to pursue further engagement with the teacher. This appears to be a crucial stage that can easily be overlooked by even the most attentive teachers—if they don't know what to look for beforehand. Essentially, teachers should observe the children and note what they show interest in. Then, engage with the children from that perspective (not the adult's perspective) in ways that support further curiosity—which will in turn help facilitate language development. This may seem counterintuitive. And it is the opposite of what some teachers naturally tend to do when they are with little ones. On this point, Snow's words gave me a lot to think about.

## When the questions begin...

A [monograph by](#) Michelle Chouinard and colleagues talks of the frequency and intensity of young children's questions. She analyzed transcripts from five different children (ages 18 months to five years). In her study, the least talkative child asked 50 questions per hour(!) while the most talkative child asked 150 questions per hour. Extended, that comes to 220,000 to 660,000 questions by the age of four. According to Snow, adults are incorrect in assuming that most of the questions were not important; 60%-80% of the questions asked during this crucial developmental period were "truly information-seeking questions." The children were asking for explanations, what words mean, and why things happen the way they do. A staggering 90% of the unanswered questions come back again, so this tells us two things: (1) the children are listening to the answers [even if they may not appear to be], and (2) it makes sense to answer these questions as they come up because they *will* resurface if the reply is not satisfactory.

From the developmental perspective, responding to questions in a timely fashion provides well-timed linguistic input as well as real-world knowledge. It also continues to nurture curiosity instead of dampening it. As Snow puts it, “...children who are curious will drive their own learning throughout the rest of their lives.” And so, responding to a question with a shrug (killing the curiosity) is not in the same ballpark as responding with, “Well, I don’t know the answer but how about we look it up to find out? Want to do that? Let’s go find that answer!” The former does not help foster the skills and attitudes that we most want to nurture in children at that age. The latter models the skills and attitudes that we do want to nurture in them.

## What should adults ask?

Adults can also (and should also) ask questions. When possible, it is typically better to focus your time on open-ended questions. For example, you may want to start with a yes/no question as the primer and then spend the bulk of the time exploring thoughts with open-ended questions—*Do you like watching the cars? What do you find interesting about them? I see. Why do you think this is...?* According to Snow, these open-ended questions can generate an entire and rich conversation whereas a yes/no question is a lost opportunity unless it is followed by a more engaging pathway question.

## Dialogic approaches?

Dialogic approaches to reading have been widely proposed as one context in which adults can ask the kinds of questions we've discovered in research are the most productive. Dialogic reading itself refers to a rather specific set of techniques. But if you think about dialogic approaches to reading more generally, you might ask, “well, is there something special about books? Why book reading?...why not just read the book to the child? Why do we have to have any dialogue about it?” (Snow)

It is intuitive for adults to see books as a repository of information, and so children should just open them up and read. Yes, this is one way that obviously works—but is it the optimal way? In Kurt Fischer’s work with [Dynamic Skill Theory \(1980\)](#) [this is a great video with Kurt explaining it], there is an important distinction between *low support contexts* and *high support contexts*. A child just attempting to read a book alone is of course an example of a low support context for reading—it is just enough to get by. But if there is an adult who is there to create a thoroughly engaging dialogue around the book’s content in real time, it produces a high-support context that vastly enriches the experience for the child ([click here for a brief reading on how this works](#)). Moreover, even just a display of enthusiasm for the book can make a life-long impact on a child. “Favorite” books are born in this way. Snow advocates

eliciting responses to open-ended questions while reading with a child; having them explore concepts in real time is what makes the dialogic approach optimal. It is also a great opportunity for the child to learn about *talking about books*—this is especially so regarding books that they have already enjoyed reading (dialogically) several times in the past.



Adults can be the great facilitators of dialogic reading. However, children’s input should not be quickly rejected or automatically discounted in favor of the adult’s choices. If nurtured well, children can generate great questions about their reading, too. That would mean the adults can “work forward” from the interests that are on display. According to Snow, if you observe a classroom—even a diverse one—you can eventually clump major questions into categories, and let these categories of questions inform and lead the teaching. This has the potential to be immensely satisfying for the children—especially if the most commonly raised questions are tackled.

## What about the more mature children?

We want older students and adults to be able to do things like read a report in a newspaper and say, gee I wonder what the source for that was, I wonder if that's actually a correct representation. Are there really weapons of mass destruction? I don't know; there's no evidence in this article... That's the kind of critical reading that we have to expect of good citizens, of responsible adults, and that kind of deeper reading comprehension requires much more than just decoding and oral comprehension. (Snow)



It would be normal for a teacher to try to teach reading comprehension through reading, right? Well, Snow makes a fascinating case *against* reading for this purpose. According to Snow, children learn the most pertinent skills for critical reading comprehension through talking, not reading: “The best place to acquire those skills is in oral discussion, is in oral interactions, with their peers and with their teachers.”



Her argument makes sense when you consider the skills that are required: skills in academic language, perspective taking, understanding complex arguments, making complex arguments, and building relevant content knowledge. It would seem the bulk of that can be learned more deeply and effectively through engaging classroom dialogue than reading about it. But does classroom discussion work to build deep reading comprehension skills?

Well, for one thing, it provides opportunities for students to defend the positions they're taking, to express their own perspectives on a topic, but also to understand that their classmates, their best friends, perhaps, might have a different perspective on that same topic. And thus, they have to defend their own position, but also listen carefully and understand alternative positions... It gives students an opportunity to sound authoritative, because perhaps they've gone off and actually read something that they can use as evidence in support of their own view on these topics. (Snow)

And so, although having debates and other engaging classroom dialogues may seem far from critical reading, it may be the most efficient way to go about this.



## Summary and logical extensions

- The 30-million-word gap is not really about a gap in vocabulary, but a gap in information accessibility.
- Parents often don't know what to talk about with their children. They need guidance.
- Kids have interests. If we take note of those interests, we can explore the answers together. We should do this when possible.
- If we design classes around student interests, we will likely have more engagement with students and we will be able to model good learning because of this optimized learning context. This helps ensure that what we teach is usable in the future in some capacity.
- Dialogic reading is optimized learning.
- Children model their learning attempts on what they see from adults. Adults should show curiosity in learning.
- When children's interests are squashed by little or no useful communication, further motivation to pursue the area may dwindle. This is inefficient.
- We should provide optimized learning experiences by allowing children to have meaningful talking time. While it may seem counterproductive, for the brain, engaging in dialogues regarding learning is often the most efficient path to deeper learning.

Parents and teachers may be doing their best, but the results of their best can result in staggering differences down the road. Snow gave me much to think about. The above list is deeper than it may seem at first glance. Moreover, she has a way of providing “upside down” solutions. She said the obvious solution of “talk more” to reduce the gap is unsatisfactory. She said not to read more to improve critical reading skills—spend more time having critical discussions instead. Want your kids to be smarter? Talk more about “nothing” at the dinner table—and make sure you explore it together. Ask more about “nothing” in the classroom—and be sure to explore it together. Engagement via co-creation and co-exploration will be the magic key that provides access to vital knowledge today and vital knowledge in children's futures—and this is what really makes the difference in their lives.

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**Robert S. Murphy** (PhD) Associate Professor, University of Kitakyushu. Japanese-American with most of his life spent in Japan teaching English and sciences. Mentored by Dr. Kurt Fischer at Harvard and a leading voice in the "Mind, Brain, and Education" movement in Asia.

# GOING DEEPER

This Annenberg [video](#) models the optimal interactions Robert describes.

## Scaffolding: Johanna and Her Mother with Commentary

Using the video of Johanna and her mother as illustration, Prof. Kurt Fischer explains the role of scaffolding in learning.





## THINK TANK: CHILDREN

Written by: Skye Playsted

# The Unique Language of a Child with Learning Difficulties

I was almost brought to tears in front of a class of 10-year-old students recently. While I was teaching a class, a boy with “learning difficulties” (a term Barbara Arrowsmith-Young prefers over “disabilities”<sup>1</sup>) had an emotional meltdown. Two of his classmates were having a play-fight as they made their way into class after lunch, and he became agitated and ready to cry because he couldn’t understand why they were pretending to hurt each other. I tried to help him cope with the overflow of his emotions, but I also had 25 other kids in the class to look after and I couldn’t leave



the room to help him find a quiet place outside to calm down.

A girl in the class asked me if she could help—her brother had learning difficulties too, and so she felt she might be able to help her upset classmate. She sat down with the boy outside the classroom

and talked with him. After a few minutes, she asked the boy if he felt OK. He nodded and returned to the classroom to sit with his friends. Emotions settled down, the friends who had the play-fight apologized to the boy, as they had not adequately considered the needs of their classmate, and everyone got on with their work.

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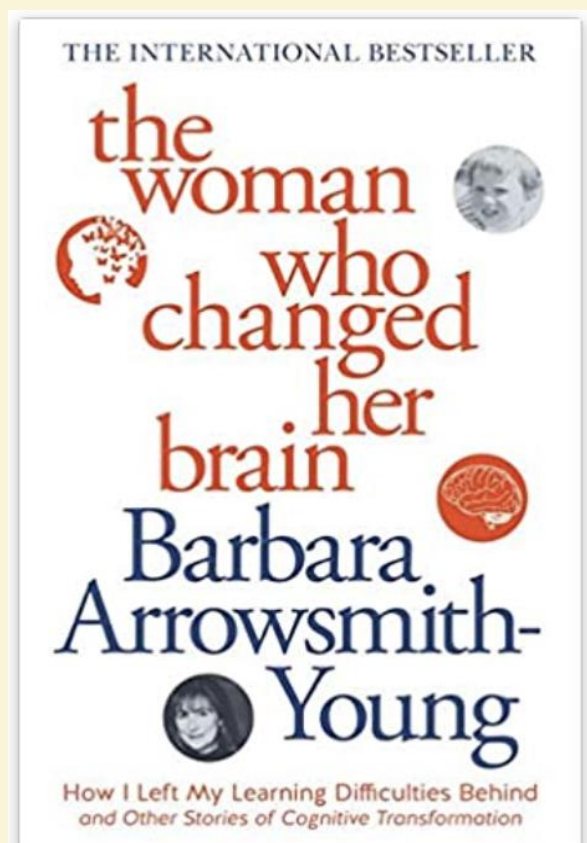
<sup>1</sup> In this article, I've used the broad, non-prejudicial term of "learning difficulties" that Barbara Arrowsmith-Young uses. See here for examples that are included in her definition: <https://arrowsmithschool.org/descriptions-of-learning-difficulties-addressed/>

I thanked the girl who had helped to soothe her classmate with learning difficulties. "Oh, that's OK," she said. "It's just because I know how to communicate with him." This was her gift, she told me: the gift of being able to speak his language. She knew his language because she'd grown up with a brother who spoke it. Not only did she know how to speak his language, but she could also interpret his language for others, and this is what she had done for me. Now it was my turn for a strong emotional response! The insight and maturity shown by a 10-year-old girl prompted me to reconsider my views and approaches to teaching children with learning difficulties.

## Learn about your students' learning difficulties

Teachers would all agree that each of their students has unique learning challenges and strengths. This is because every brain is different. But how much do we *really* understand and cater for the diverse needs of our students with learning difficulties? It's something few of us were adequately trained in as preservice teachers. If you're like me, you may see it as the role of the specialist learning support teacher to intervene and help these students. Too often, we leave it up to the learning support teachers, or even the students with difficulties themselves, to fill in the gaps for us. "If only they could tell me what the problem is, I'd be able to help them." "How do I teach this child?" "Can you tell me what I need to know about their learning difficulties?"

It's difficult for students or parents to talk openly with teachers about the challenges of a learning difficulty, because there is a stigma attached to it. But a lack of understanding about learning difficulties can result in devastating effects on a student's self-esteem, self-awareness and their ability to relate effectively to others (Arrowsmith-Young, 2020). I think it's time for *us*, the "mainstream" teachers, to start taking a more proactive approach to learning about our students' cognitive differences and the behavioral challenges that often accompany them. One way we can do this is by reading and learning more about neuroscience in education. If you're interested in learning more





about this area, there is one person whose book should be on your reading list:

[Barbara Arrowsmith-Young](#).

## Barbara Arrowsmith-Young: The woman who changed her brain

Barbara Arrowsmith-Young is an example of a teacher who has devoted much of her life to learning about cognitive differences and working with brain plasticity to develop areas of the brain where cognition is impaired. Born with several undiagnosed learning difficulties, Barbara was nevertheless able to achieve highly in certain academic areas through her own efforts after school and university. She spent hours after school memorizing facts that others could have

learned in a short time or replaying movie dialogues and song lyrics over and over to try and make sense of them. At university, she worked through the night reading papers 20 times over to get the gist of the text. This was exhausting but seemed the only solution to working with her learning difficulties.

Educational researchers at that time believed that damaged brain cells could not be restored, and

compensations to work around the problems were the only option available: if you struggled to read text, you listened to audio books; if you were slow at completing a test, you needed to take more time to do the test. For Barbara Arrowsmith-Young, the compensatory measures she had devised to make sense of her studies and her world were the only way she could achieve academic and relational success.

However, the research on brain plasticity that she was reading suggested something different might be possible. After reading the work of [Luria](#) and [Rosenzweig](#), Barbara began to wonder whether weaker areas of her brain could be strengthened with specific exercises, in the same way that any other physical area of the body might be strengthened through exercise. She gradually developed exercises to work on certain areas of the brain, and experienced success which she attributed to changes in the brain as a result of these exercises. Barbara tailored exercises to her specific needs.

“We didn’t give him those gifts, he had them. But we gave him the engine to operate the gifts.”

Anecdotal reports from students who have been part of the [Arrowsmith Program](#) have been positive. While the empirical research behind the approach Barbara has pioneered is still emerging, some studies suggest that cognitive changes in participants with learning difficulties are occurring as a result of exercises used in the Arrowsmith Program.

These changes are across a range of areas, including visual and spatial awareness, attention, executive functioning, visual and auditory learning, and social or emotional awareness.



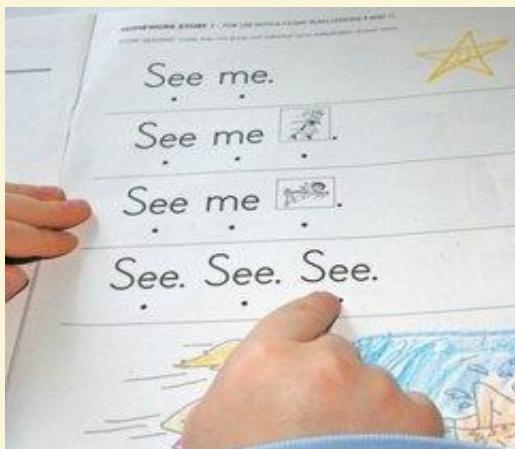
If you are interested in reading overviews of this research, you can find them [here](#). As is the case in every academic field, there are differing views on the research behind Barbara Arrowsmith-Young's work. Critics of the work claim that it [has not been scientifically supported that the cognitive exercises](#) she has developed remediate learning difficulties. One point to consider is that Barbara's personal experiences with these cognitive exercises took place during what she has termed the "pre-neuroplastic paradigm" of education (Arrowsmith-Young, 2020, p. 251). Educational research can be slow to welcome views that challenge traditional, established expectations of children with learning difficulties. For now, I am happy to listen, read and learn about the ongoing research developments in Arrowsmith-Young's work, and to see how these contribute more to the field of educational neuroscience.

## Think differently about kids who think differently

As I reflected on Barbara's story and my experiences with a class of 10-year olds earlier this year, I began to think differently about learning difficulties. I began to realize that we are all on the continuum of learning difficulties. We all have cognitive strengths and weaknesses, because brains and lives are unique. There are many different factors that contribute to our cognitive strengths and challenges, but are we willing to try the innovation that Barbara has shown: to challenge ourselves to look for what we *can* do, rather than what we *can't*? In the same way, can we recognize the unique gifts that a student with learning difficulties has, as Barbara Arrowsmith-Young did when she recounted a story of a student with challenges who was part of the Arrowsmith program, and later went on to study design at university and won prestigious awards for designing racing cars: "We didn't give him those gifts, he had them. But we gave him the engine to operate the gifts" (Sirota, 2020).

## Learn your students' languages

Not long ago, I used to feel apprehensive when a student with learning difficulties was put into my class. I saw teaching them as a challenge, or a "problem" that I wasn't equipped to deal with. Since my experiences earlier this year, however, my



perspective has changed: what I once saw only as a "problem," I now see as a "gift." There are still challenges, but I now see teaching these learners as being like an opportunity to travel to a new place and learn a new language I haven't learned before. The change in my perspective has been more than an emotional response. You could say that, like Barbara, my *brain* has changed with my new learning experiences and

how I use them in my professional work as a teacher.

No matter how long we've been in the classroom, or which areas of education we work in, we have an opportunity to see things from a new perspective. Even if we are not trained as specialist learning support teachers, we should take an assets-based, rather than a deficit view of our students with learning difficulties, by focusing on what students *can* do rather than what they *can't*. We should not see a child with learning difficulties in terms of what they cannot do, but rather, as someone who speaks a unique language that we can learn. This is the lesson I learned from a 10-year-old girl and her friend with learning difficulties. And in doing so, I learned to observe, listen, and communicate better with my students—every single one of them.

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(Images from freeimages.com and Mikhail Nilov on Pexels)

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## THINK TANK: CHILDREN

Written by: Ai Murphy

### Lesson Plan: “Foods of the Rainbow”—*Not the Brown Palette!*

#### A common issue with food choices...

Typically, the young ones do not choose the best foods available to them. As teachers, we may not have much control over what our little ones eat every day; however, we *can* teach them how to be healthfully selective of foods during our lessons on colors and food names. From classroom experience, it seems that we can successfully begin introducing these concepts as early as around 2 to 3 years of age. Our brains are made and maintained by the nutrients that we consume. Well-balanced nutrition, especially good quality fats, help create healthy neurons. Healthy neurons are efficient neurons; they can transfer information more readily. Healthy neurons also have the potential to create better synaptic connections; they are typically better at making optimized networks. There is also [fascinating research](#) on how the gut influences brain health. So, we should get our kids in on it early, and have them stick with it!

#### Not the brown palette!

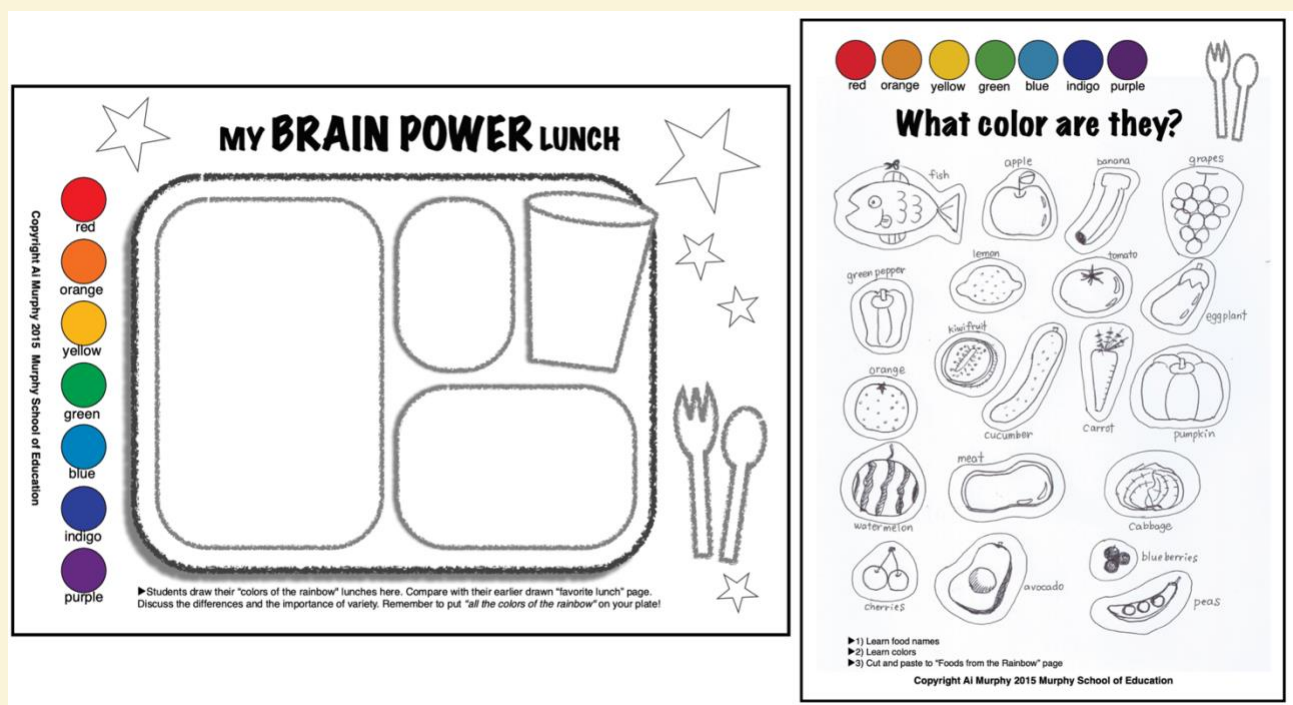
Choosing a set of colorful foods leads to the consumption of more of the essential vitamins and minerals which may be lacking if the “*brown palette*” is the norm for the child. What can be wrong with a brown palette of food? *Not all brown foods are bad for us, but...* brownish foods chosen by children are often junk foods that are one of, or a combination of, these three: carbohydrates, protein (processed meats), or fat (deep fried foods). Carbohydrate loading can cause high blood sugar—which may cause [sugar crashing \(reactive hypoglycemia\)](#) and even diabetes down the road. Fatty and processed meats are famously unhealthful, and the worst is of course the trans



fats in fried foods—among other issues, *they cause neurons to have [weak membranes](#), [faulty communication](#), and [cognitive decline](#)*. And so, the teaching of good eating habits could make a huge difference in our little students’ future lives. Talk about teachers making a difference!

## Advice for the classroom

If you teach young ones, you will recognize that teaching colors and food names is an integral part of the job for most of us. The next time you chose food words to teach, intentionally select them from the seven colors of the rainbow— red, orange, yellow, green, blue/indigo, and violet —and work them into your lesson plan, as below.



These are two pages out of the five-page PDF lesson plan that you can download. Here’s [the link for the worksheet PDF](#). Download, print, and feel free to use it in your classrooms.

## How does this work in a lesson?

The aim of the activity is to raise consciousness of students’ food intake.

- 1) First, ask students their favorite food(s) for lunch. Let students draw freely on Page 1 of the worksheets—with crayons/color pencils. This makes it easier for them to contrast it with what they will produce later in the lesson.
- 2) Second, teach the food names on Page 2. Speed/style depends on how well they already know these words.

- 3) Then, elicit the colors of the foods on Page 2 such as “What color are these fish?” “What color are these apples?” (For more mature learners, “What color *should* this apple be?”)
- 4) The students go on to coloring the foods and then cutting and pasting them on Pages 3 and 4 to match the food colors and color icons.



- 5) If the students are mature enough to build a rudimentary understanding of neurons, blood sugar levels, and the importance of vitamins and minerals, then the next step is helping them make the connection between better food choices and healthy brains; this essential content could/should be done in the native tongue. If the students are not yet ready for these scientific concepts, just let them choose food from each color and be happy with making a beautiful rainbow set of foods.
- 6) Page 5 is a poster page for them to make their understanding visible (as a poster presentation). Ask students to choose at least one food from each color of the rainbow and make the plate as colorful as nature is. Make sure their plates display multiple colors from the rainbow and then discuss their choices. This validation is important for the students.
- 7) Older students might be able to think of some multi-colored foods (such as salad) and go on to investigate the ingredients based on the colors they remember. That is fantastic learning, so integrate that into you lesson plan if

you teach mature students. Don't forget to provide validation through a nice discussion of what they come up with.

- 8) At the end of the lesson, have the students show the poster to the class and introduce what they currently chose to eat for lunch. It can be as simple as pointing and saying, "red apple" and "orange carrot."
- 9) The great *aha moment* comes when they explain the differences between their Page 1 favorite lunch (typically a brownish palette) and the new colorful poster at hand. It is a great *aha moment* for parents, too!



“  
Eating is living;  
living is eating.”

Good learning comes more efficiently with a healthy body. Food is deeply culture-oriented and so there is always something more to teach and learn about. If the students get interested in foods from around the world, they might have higher motivation to learn languages as well. This may

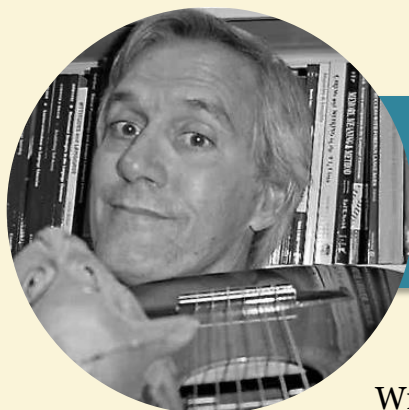
be another *aha moment* for them. After all, food is our fuel. Eating is living; living is eating. Why not incorporate all of that into our lessons and help the young ones make better choices? I hope you enjoy teaching this in your classrooms/homes and please do contact me with questions and your success stories! (Email:

[rita@murphyschool.com](mailto:rita@murphyschool.com))

(All photos are from Murphy School of Education—lessons with children.)

*Ai Murphy teaches children ranging from one to fifteen years of age at the Murphy School of Education. Ai also counsels parents regarding bilingual education in Japan and child rearing. Because she was raised by a restaurant-owning family, Ai is into proper cooking—with healthy ingredients.*





## PLUS: Teacher Story



Written by: Tim Murphey

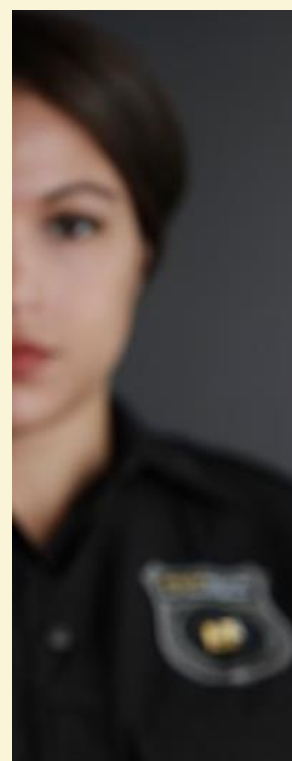
# Relating Deeply: Security Guards & Goddesses

About seven years ago a new security guard started working at one of the several part-time universities I work at and I nodded to her in passing. She nodded back. Then a year later we were still nodding but also smiling and from a distance started to wave now and then. Push a few years forward and we started actually saying a word or two “Otsukaresama” (thanks for your work—a typical Japanese greeting and farewell). Later, I dared to pose a question “Genki?” (healthy?) and we actually exchanged some real words.

Then she shocked me one day asking in halting English, “How ... are ... you?” And I said, “I am fine,... and how are you?” She inhaled deeply for a few seconds with her eyes looking up at the multiple Japanese heavens. Her brows furrowed and then drawing on everything she remembered she said pointing to the sky “Not good. Rain. Careful!”

She is a university security guard but she also seems to be a goddess who spreads social interaction to help people socialize. I suspect her role as goddess is more important than her role as security guard—certainly more frequent, and probably contributing to better security.

I had a student once approach me in the hallway of the same school who wanted to give me some homework and she suddenly fainted and I caught her before she fell down. And guess who else showed up quickly enough to help us? Luckily, the security guard was nearby and we both took the student to the health center. Over the last few



years, I have come to appreciate more this woman who is there to help and protect us all, but who seldom seems to get appreciation and acknowledgement from others.

Just before our Christmas break last year, I was going through the end of one building that has an open area with a ceiling three floors up. It is a place where I sometimes stop and sing when no one is there because the “echo chamber” makes your voice feel like you are on stage singing at a concert. I sang a short songlet called “Love you Forever” from the children’s book by the Canadian Robert Munsch. It goes:

*I'll love you forever, I'll like you for always*

*As long as I'm living, My baby you'll be.*

As I was finishing the songlet, thinking I was all alone, I suddenly noticed someone emerging from the shadows behind me in the corner of my eye. The security guard walked over and said “Naisu.” [Nice!]. I smiled, I stumbled, and then flew, “Nihongo mo dekiru” [I can do it in Japanese!] and I sang:

*Aisteru yo Nani ga a temo*

*Ikiterukageri itoshi koyo*

She smiled. Then I noticed her eyes looked watery. After a silent moment, full of connection, we said goodbye. For some reason I felt like that was the best Christmas gift I could have given.



I still do not know her name even and we have never exchanged more than greetings over the seven years. But that is the power of songs: you can say “I love you” to strangers (and almost strangers). You can express things to people that you seldom dare say to anyone. Songs offer a deep sense of civility (Porath, 2016, highly recommended,) brain health (Sacks, 2007) and connection (Hari, 2018).

I told the above story to some students just before Christmas. And one came up to me at the end of class and said she had already sung the song to her mom who lived several prefectures away on the phone, after we had read the story in our class a

month previously. Her mom apparently asked her to send her the song lyrics in an email. She did and her mom printed it out and posted it on the door for her husband and siblings to see. What a great message to read before leaving home, or simply to have in mind when seeing people you appreciate, or to sing inside your mind, anytime, anywhere, or out loud to whoever may be there. Be brave. Go ahead and sing. Small acts and messages change the world, and yourself. Don't wait for Christmas!

I think our security guards and gods would say that singing is not only safe but also *bio-psycho-sociologically* and neurologically healthy for us. (And sometimes more so for those who hear us!)



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# PLUS: Writers Needed



## Call for Contributions

Become a Think Tank star! Here are some of the future issue topics we are thinking about. Would you, or anyone you know, like to write about any of these? Or is there another topic you'd like to recommend? Do you have any suggestions for lead-in, or just plain interesting, videos? How about writing a book review? Or sending us a story about your experiences? Contact us.

### *In regard to Think Tank articles, what we want most is:*

- Engaging writing, not dense or academic
- Some information from brain sciences and language teaching
- Expanding on or reacting to our intro video

### *Future Think Tanks (the list is not exclusive)*

**Learning & Memory**  
**Bias**  
**Drama**  
**Conferencing**  
**Teaching Brain to Ss**  
**Design**  
**Motivation**  
**Study Habits**  
**Games**

**Movement**  
**Mindsets**  
**Learning theories**  
**UDL**  
**Humor**  
**Plasticity**  
**Food and Gut**  
**Task-based Learning**  
**IQ-EQ**

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