

**move THINK**

**Executive Function in the Classroom**

30 Proven and Effective Self-Regulation and Executive Function Strategies For Children with Sensory Disorders, Learning Disabilities, Anxiety and ADHD

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@drlynnkenney

**THE KINETIC CLASSROOM**

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**BLOOM** 50 Things to Buy that are Fun, Functional, and Fun!

**70 PLAY Activities** for Sensory, Self-Regulation, Learning & Attention

**BLOOM YOUR ROOM** with Sensory, Self-Regulation, Learning & Attention

**Musical Thinking** 5 SIMPLE STEPS To Teaching Children How They Think. The Quick Start Manual.

**Play Math**

**THE KINETIC CLASSROOM**

**THINKERBEE THEATER**

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Materials that are included in this course may include interventions and modalities that are beyond the authorized practice of mental health professionals. As a licensed professional, you are responsible for reviewing the scope of practice, including activities that are defined in law as beyond the boundaries of practice in accordance with and in compliance with your profession's standards.

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### Coaching Executive Functions

### Cognitive-Physical Activities

**Build Executive Functions**

Self-control, attention, memory, cognitive flexibility, previewing, planning, organization, self-regulation

**Teach Self-Regulation Skills**

Spotlight, Think-Ups, Calm Me Downs, CogniTap, Bouncing Balls, Bean Bags, Musical Thinking

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- Learn the biological precursors to executive functions and learning
- Learn how coordinated rhythmic beat-based motor movement engages executive function
- Practice strategies to help children move out of the stress response into an alert state of calm
- Experience proven cognitive-motor activities to enhance thinking and self-regulation
- Improve how children learn by teaching them how their brains work
- Close the education gap in poverty with movement and cognition

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- Implement research-based activities educators, teachers and clinicians can use to improve thinking, self-regulation, learning and behaviour.
- Learn the relationship between cognition and motor movement.
- Explore bringing physical activity to the classroom, clinic and home with coordinative cognitive-motor activities.
- Practice over 30 activities you can do to help children with ADHD, dyslexia, ODD, sensory processing challenges, dyspraxia, anxiety and behavioural issues.
- Learn how to enhance collaboration and cooperation in your classroom by teaching children applied neuroscience

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THE KINETIC CLASSROOM PART I

- The "Ready To Learn" Brain
- Building a Prosocial Brain
- Engaging Subcortical Structures
- Musical Thinking
- Building Your Own Cognitive-Motor Patterns Sequences & Phrases
- Cognitive Neuroscience

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THE KINETIC CLASSROOM PART II

- The "Cognitive Conversation" about Attention
- CogniTap + Spots for Alerting & Regulating
- Music, Drumming and Sound for Cognitive Engagement
- Refining Your Tool Box of Cognitive-Movement Sequences + Coaching Strategies for Your Setting

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THE KINETIC CLASSROOM PART III

- Language, Dyslexia, Reading & Learning
- Beanbags and Balls For Alerting and Calming
- The "Cognitive Conversation" about Working Memory
- Self-Regulation, Response Inhibition, Self-Control and Emotional Modulation
- Spotlight to original Cognitive-Visual Motor Language
- Rhythm Ball and Heavy Work

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**Q:**

How have our fields grown and changed in the past 10 years?

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**Advancements in Technology Neuroscience**

Then...	Now...
Alexander Luria	fMRI Diffusion Tensor Imaging Deep Brain Stimulation

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**COGNITIVE DOMAINS**

<ul style="list-style-type: none"> <li>• Self-Control</li> <li>• Response Inhibition</li> <li>• Self-Regulation</li> <li>• Learning to move, speak, respond &amp; think slowly with intention</li> </ul> <p>S</p>	<ul style="list-style-type: none"> <li>• Attention</li> <li>• The Attention Cycle</li> <li>• My Attention Engine</li> </ul> <p>A</p>	<ul style="list-style-type: none"> <li>• Memory Working</li> <li>• Short-term</li> <li>• Long-term</li> <li>• Visual Working Memory</li> <li>• Auditory Working Memory</li> <li>• Encoding &amp; Retrieval</li> </ul> <p>M</p>	<ul style="list-style-type: none"> <li>• Cognitive flexibility</li> <li>• Coping with perceived loss</li> <li>• Adapting to new circumstances</li> <li>• Cognitive shift</li> </ul> <p>C</p>
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MOTOR DOMAINS

- Balance
- Weight Shift
- Rhythm
- Tempo
- Timing

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FOCUS ON THE BEAT

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THE KINETIC CLASSROOM PART I

- The "Ready To Learn" Brain
- Building a Prosocial Brain
- Engaging Subcortical Structures
- Musical Thinking
- Building Your Own Cognitive-Motor Patterns Sequences & Phrases
- Cognitive Neuroscience

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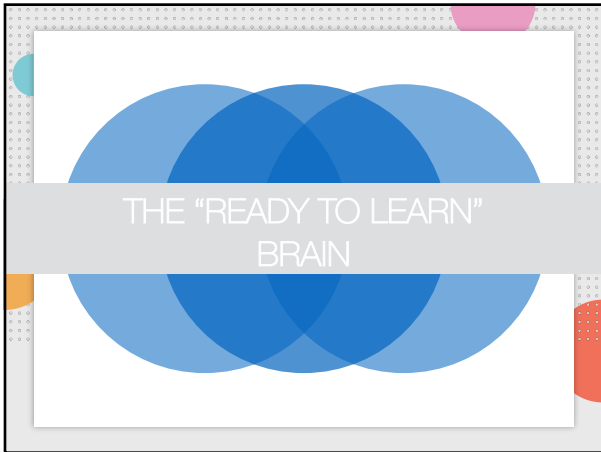
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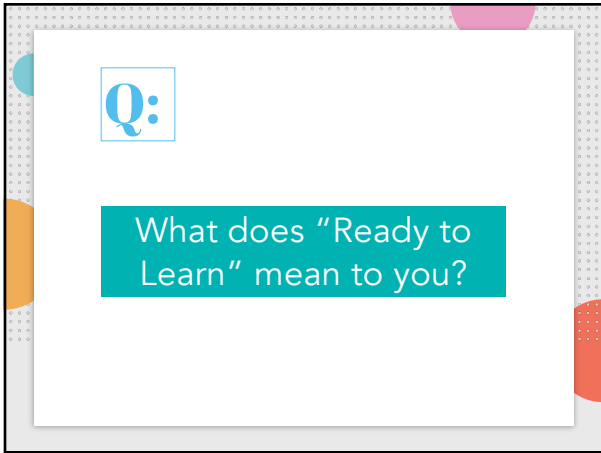
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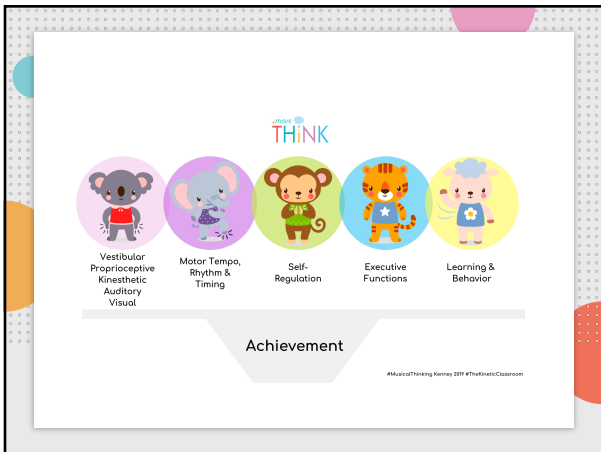
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Executive Functions are Precursors to Achievement

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100's of Millions of Dollars Spent Annually on Curriculum Content & EdTech

**EXECUTIVE SKILLS OPEN THE LID**

"I am expected to meet all of these academic milestones with students who cannot sit still, are unable to listen and forget what I taught them 5 minutes ago."  
 Mariah N. Los Angeles

**Focus Self-control Memory**

"You can't pour water into a bottle when the lid is closed."

Bruce Waxler, MD Yale School of Medicine

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As early as **9 Months** of Age, Children in Low Income Families Have Lower Activity in the EF Areas of the Brain

Frontal Lobe Activity is related to Attention and Language at 16-18 months.

Frontal Lobe Activity at 16-18 months Predicts Language at 4-5 years.

Low Activity → High Activity

Low-Income High-Income

P Tomalski et al *Developmental Science* 16:676-687 2013

Bruce Waxler, MD Yale School of Medicine

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## Cost of Low Executive Function

- 50% more likely to Repeat a Grade
- 57% Receive More Disciplinary Actions
- 50% more Money to Educate
- 2x More Teacher Time
- 8 x more likely to drop out of high school

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### Adverse Childhood Experiences

Traumatic events that can have negative, lasting effects on health and wellbeing

**Abuse**

- Emotional abuse
- Physical abuse
- Sexual abuse

**Household Challenges**

- Substance use
- Marital stress
- Parental divorce/separation
- Household chaos

**Neglect**

- Emotional neglect
- Physical neglect

**4 or more ACEs**

- 3x the levels of lung disease and other smoking
- 14x the number of suicide attempts
- 4.5x more likely to develop depression
- 11x the level of retinovirus (shingles)
- 4x less likely to have begun intercourse by age 15
- 2x the level of liver disease

**67%** of the population have at least 1 ACE

**20 yrs** earlier than those who have none

**1/8** of the population have more than 4 ACEs

**Adverse childhood experiences are the single greatest unaddressed public health threat facing our nation today**

Dr. Robert Block, Past President of the American Academy of Pediatrics

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## Research Study Design

There are four main types of Quantitative research: Descriptive, Correlational, Causal-Comparative/Quasi-Experimental, and Experimental Research.

Randomized controlled trial: (RCT) A study in which people are allocated at random (by chance alone) to receive one of several clinical interventions including a control group. RCTs attempt to establish cause-effect relationships among the variables.

A cross-sectional study is descriptive. It examines the relationship between disease (or other health related state) and other variables of interest as they exist in a defined population at a single point in time or over a short period of time (e.g. calendar year).

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**Q:**

What accounts for the increase in developmental, medical and mental health disorders in the US?

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**Then & Now**

 <ul style="list-style-type: none"> <li>Play outdoors</li> <li>Play in nature</li> <li>Swing upside down from trees</li> <li>Jump into lakes</li> <li>Balance on rocks</li> <li>Go on field trips</li> <li>Watch Television</li> <li>Creative &amp; Imaginary Play</li> <li>Dig and build</li> <li>Tunnel and crawl</li> <li>Take more physical risks</li> <li>Play more hard games, rhyming songs and jump rope</li> </ul>	<ul style="list-style-type: none"> <li>Less free time</li> <li>More structured and scheduled play</li> <li>Less unstructured time with family</li> <li>More isolation with digital devices</li> <li>Fewer family dinners</li> <li>Less time outdoors</li> <li>Less physical movement</li> <li>More sitting</li> <li>Less opportunities for vestibular and sensory activities</li> <li>2-3 fold increase in screen time from the 1990's to 2018</li> </ul> 
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Source: Peck, 2018; CDC/NIH; Congressional Kids, 2018; Common Sense Media 2018; News, 2017

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**ADHD**

ADHD is among the most common neurodevelopmental disorders of childhood.

ADHD's worldwide prevalence in children is estimated at 5.5 percent, though figures vary. The current rate of children diagnosed with ADHD in the US is reported to be 10-11 percent. (CDC, 2019)

ADHD in childhood is more prevalent in boys than it is in girls by a 3:1 ratio. The difference attenuates by adulthood, when prevalence is about the same.

Children who begin school as the youngest in their cohort have a higher risk of being diagnosed with ADHD (Howard, 2008).

Raising a child with attention deficit hyperactivity disorder (ADHD) costs American families an estimated \$5.8 billion every year—5 X more than raising a child without ADHD—according to a new study by researchers at FIU's Center for Children and Families.

**THEN AND NOW**

Percent ever diagnosed with ADHD

Year	Overall	Ages 4-11	Ages 12-17
2015-2016	10.2	7.7	13.5
2013-2014	9.4	7.9	11.3
2011-2012	9.6	7.7	12.0
2009-2010	9.0	6.9	11.9
2007-2008	8.1	6.1	10.9
2005-2006	7.5	6.0	9.3
2003-2004	7.3	5.8	9.3
2001-2002	7.2	5.9	8.9
1999-2000	6.5	5.3	8.2
1997-1998	6.1	5.3	7.2

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## Pregnancy Complications and Health Disorders have increased in the U.S.

### RATES OF PREGNANCY COMPLICATIONS

Infertility (Women)   6%	Low Iron/Anemia   20-40%*
Infertility (Men)   6%*	Caesarean Sections   33%
Inability To Carry Baby To Term   11%	Still Births   1%
Miscarriages   15-20%*	Low Birthweight   8%
Gestational Diabetes   9%	Pre-Term Births   11%
Preeclampsia   2-8%*	Post-Partum Depression   13%*

### RATES OF CHILDHOOD HEALTH DISORDERS

Autism   1-2%	Asthma   9%
Birth Defect (heart, other)   3%	Childhood Obesity   17%
ADHD   11%	Depression   7%*
Learning Disabilities   8%	Bipolar   Rapidly rising diagnosis

### SUMMARY

Pregnancy complications and childhood health disorders are very common in the U.S. The recommendations in *The Healthy Child Guide* will help you reduce those risks and improve the health and development of your child. Learn more in the following pages.

Data is from the U.S. Centers for Disease Control (CDC) [www.cdc.gov](http://www.cdc.gov) except for their marked with an asterisk which are their research articles.

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## Kids are More Anxious & Depressed

Rates of depression and anxiety among young people in America have been increasing steadily for the past 50 to 70 years.

Today, by at least some estimates, five to eight times as many high school and college students meet the criteria for a diagnosis of major depression and/or anxiety disorder as was true half a century or more ago.

This increased psychopathology is not the result of changed diagnostic criteria; it holds even when the measures and criteria are constant.

- Decline in Young People's Sense of Personal Control Over Their Fate (locus of control)
- Shift Toward Extrinsic Goals, Away From Intrinsic Goals (grades, money, external rewards)
- Decline in Free Time & Free Play
- More Time Spent on Digital Media
- Diminished Consumption of Clean Whole Foods & Water
- More exposure to Pesticides & Toxins

Sources: Peter Gray, 2010; Neurological Health Foundation, 2018

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To the extent that my emotional sense of satisfaction comes from progress toward intrinsic goals I can control my emotional wellbeing.

To the extent that my satisfaction comes from others' judgments and rewards, I have much less control over my emotional state.

PETER GRAY PH.D.  
FREEDOM TO LEARN

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**C O M O R B I D I T Y**

- Up to 90 percent of kids with ADHD also have executive function challenges, many of which last into adulthood, Brown, AdditudeMag.
- Dyslexia affects 15-20% of the population worldwide, IDA.
- 60% to 80% of children with ADHD or Dyslexia have a comorbid diagnosis, with 25% to 40% of children meeting the criteria for both dyslexia and ADHD.
- A meta-analysis of 175 research studies worldwide on ADHD prevalence in children aged 18 and under found an overall pooled estimate of 7.2% (Thomas et al. 2015). Thus, 7.2% of this total population is 129 million—a rough estimate of the number of children worldwide who have ADHD.
- Developmental coordination disorder (DCD) is a condition affecting 5-6% of the population, McMaster University.
- 50% of children with ADHD are also diagnosed with DCD, McMaster University.

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Learning and Achievement:  
What We Need to Know  
About The Evidence

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Self-Regulation

Executive Function

Physical Activity

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### Building Brain Literacy

- Brain Literacy is learning about brain biology and brain function to help students build metacognition and awareness of their executive function skills (Brain Futures, 2019).
- Research shows that metacognition - the ability to think about how you think - can improve learning (Bialik, 2015).
- Students with higher levels of Brain Literacy are likely more able to identify, apply, and revise cognitive skills in service of their learning and social relationships.
- When we coach students about their executive function skills we tell them "Executive Functions are Cognitive Skills and Cognitive Skills Can Be Learned."
- Improving students' brain literacy helps them to understand the relevance of cognitive interventions leading to more agency, better mastery and motivation in improving their social, cognitive and motor skills.

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### The Importance EF, Self-Regulation & Social Competency for Academic Achievement

Self-regulation refers to the conscious control of thoughts, feelings, and behavior, and involves both emotional and behavioral self-regulation. McClelland et al. focus on the behavioral aspects of regulation, which stem from underlying executive function processes of attentional flexibility or shifting, working memory, and inhibitory control (Best & Miller, 2010; Garon, Bryson, & Smith, 2008; McClelland & Cameron, 2012).

Executive Functions including Self-Regulation as early as 2 years of age predicts future academic and social success (Mulder, 2017).

Preschool social-emotional competencies predict school adjustment in Grade 1, Nakamichi, 2019.

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### Self-Regulation, School Readiness & Academic Achievement

Self-regulation has been established as a key mechanism associated with a variety of outcomes including **school readiness** (Blair and Razza, 2007; McClelland et al., 2007a; Morrison et al., 2010), **academic achievement** during childhood and adolescence (McClelland et al., 2006; Cameron Ponitz et al., 2009; Duckworth et al., 2010; Li-Grining et al., 2010), and **long-term health** and **educational outcomes** (Moffitt et al., 2011; McClelland et al., 2013).

The behavioral aspects of self-regulation maybe especially important for academic and school success (McClelland et al., 2007a; Cameron-Ponitz et al., 2009; McClelland and Cameron, 2012).

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## EF's and Self-Regulation Predict Achievement and Lifelong Success

The evidence is clear: every school in the U.S. should adopt an executive function program and executive function training should be a standard component of teacher certification programs.

Brain Futures 2019

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## Early EF Predicts Math & Reading

A wealth of studies on the relationship between EF and emergent academic skills in preschoolers, kindergartners, and older children has shown that EF significantly relates to both mathematics and literacy skills (e.g., Alexander et al., 1993; Bull and Scerif, 2001; Blair and Razza, 2007; McClelland et al., 2007, 2014; Clark et al., 2010, 2013, 2014; Welsh et al., 2010; Roebbers et al., 2012; Shaul and Schwentz, 2014; Bryce et al., 2013) in Mulder, 2017.

Detecting a pattern within a sequence of ordered units, defined as patterning, is a cognitive ability that is important in learning mathematics and influential in learning to read.

Bock et al. 2018

Early EF, assessed in children as young as two years, is predictive of emerging academic skills at the end of kindergarten.

Differences in early EF are particularly predictive of emergent mathematics, but also play a role in the development of early literacy skills.

Mulder et al. 2017

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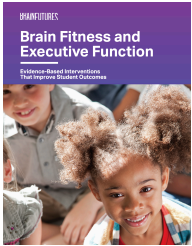
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## Improving Executive Function: Evidence-Based Interventions

- Cognitive Skills Training
  - Computerized Cognitive Training (CCT)
- Social-Emotional Learning
- Neurofeedback
- Brain Literacy
- Mindfulness
- Physical Activity



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### Health Consequences of Physical Inactivity

Research indicates that physical inactivity and sedentary behaviors are significant correlates of childhood obesity. Childhood obesity and physical inactivity may result in serious adverse health consequences such as poor executive function, cardiovascular disease, type 2 diabetes, asthma, sleep apnea, depression, anxiety and psychosocial issues, Lee et al., 2020; Favieri et al., 2019.

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### Physical Fitness

Globally, more than half of school-aged children do not engage in the recommended 60 minutes of daily moderate to vigorous physical activity (MVPA) and the childhood obesity rate has increased from 13.9% in 2000 to 18.4% in 2016 in the United States, Lee et al., 2020.

Physically fit children demonstrate greater attentional resources, have faster cognitive processing speed, and perform better on standardized academic tests.

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### Fitness, Cognition & Mental Health

**FITNESS and TEST STANDARDIZED SCORES** – Physically fit children demonstrate greater attentional resources, have faster cognitive processing speed, and perform better on standardized academic tests. Source: Educating the student body.

**FITNESS and EF's** – A growing body of research in children and adults indicates that higher levels of fitness are associated with better control of attention, memory, and cognition (Colcombe and Kramer, 2003; Hillman et al., 2008; Chang and Etnier, 2009).

**FITNESS AND COGNITIVE EFFICIENCY** – The cognitive efficiency seen in higher-fit children, is a predictor of arithmetic and reading aptitude independently of IQ and school grade (Hillman et al., 2012).

**FITNESS and MENTAL HEALTH** – Fitness is also associated with less depression and anxiety, (Kandola et al., 2019).

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