



## Executive Function in the Classroom

30 Cognitive-Physical Activities and  
Coaching Strategies to Improve  
Executive Function, Self-Regulation  
and Behavior in Children and  
Adolescents



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@drlynnkenney

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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

• Get ready!

• It's going to be a BUSY day!

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

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

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### One Day In The Kinetic Classroom

- Biological precursors of cognition and behavior
- How to teach executive function skills
- Rhythmic coordinative cognitive-motor activities
- Heavy work for dysregulation and distress
- In-the-moment self-regulation activities to calm the Caveman and engage the Thinker
- Cognitive-movement strategies to help children move out of the stress response into an alert state of calm
- The “cognitive conversation” about executive functions including self-control, attention and memory
- Musical Thinking the original visual-motor language to engage the brain

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### The Morning Program

- The “Ready to Learn” Brain
- Building Prosocial Behaviors
- Engaging Subcortical Structures
- Musical Thinking
- Building Your Own Cognitive-Motor Patterns Sequences & Phrases
- Cognitive Neuroscience

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### The Afternoon Program

- The "Cognitive Conversation" about Attention
- CogniTap for Alerting & Regulating
- Music, Drumming and Sound for Cognitive Engagement
- Developing Cognitive-Movement Sequences for Your Setting
- Language, Dyslexia, Reading & Learning
- Bean Bags, Attention & Memory
- The "Cognitive Conversation" about Working Memory
- Self-Regulation, Response Inhibition, Self-Control and Emotional Modulation
- Spotlight
- Rhythm Ball

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## FOCUS ON THE BEAT

### Priming the Brain for Listening and Learning

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- Implement research-based activities to improve thinking, self-regulation and behavior.
- Characterize the relationship between cognition and motor movement.
- Explore bringing physical activity back to the classroom with neurocognitive activities.
- Practice over 30 activities you can do to help children with ADHD, dyslexia, ODD, sensory processing challenges, dyspraxia, anxiety and behavioral issues.
- Evaluate the integration of computer-based cognitive skills training and motor movement activities.
- Choose how to enhance collaboration and cooperation by teaching students applied neuroeducation.

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## Advancements in Technology Neuroscience

Then...

Alexander  
Luria

Now...

fMRI  
Diffusion Tensor  
Imaging  
Deep Brain  
Stimulation

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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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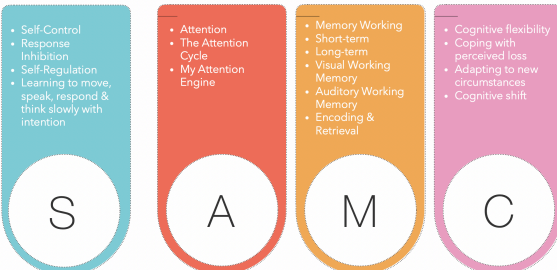
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## COGNITIVE DOMAINS




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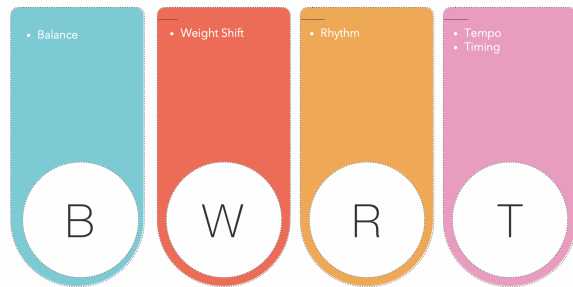
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## MOTOR DOMAINS



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## The Morning Program

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## The "Ready to Learn" Brain

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### The New Preliteracy

While we were paying attention to BEHAVIOR we learned through science, that there are important SKILLS that precede behavior. This redefines literacy for education. We learned that there are cognitive, social-emotional, and physical skills that precede both learning and behavior.

- Self-Regulation**, the ability to manage one's internal energy, emotions and impulses.
- Focused Attention**, the ability to maintain attention on a specific target stimulus, long enough to take action on it.
- Working Memory**, the ability to transiently hold and manipulate necessary information for relatively immediate access, in a short period of time.
- Sequencing**, the ability to place content, words, thoughts and actions in order.
- Self-Control**, the ability to recognize and resist cognitive and motor impulses sufficiently to take appropriate action in the moment.



THE NEW PRE-LITERACY

January, 2018

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### EXECUTIVE SKILLS OPEN THE LID

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

"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 Weisler, MD Yale School of Medicine

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More than a decade of research has shown that executive function skills, and the prosocial behaviors they promote, are more accurate predictors of academic readiness and life success than IQ or any other performance marker.

Studies have shown that children with stronger executive function skills engage more effectively with classroom learning activities and have higher reading and math achievement in elementary school than those with weaker skills, Brain Futures 2019.

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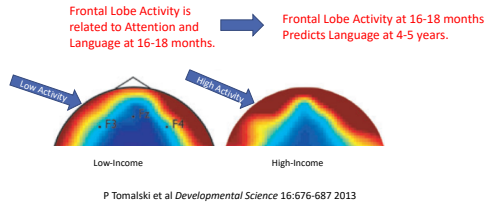
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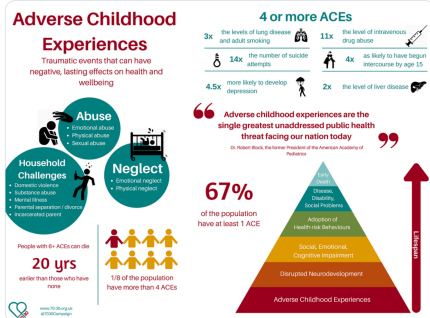
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### As Early as 9 Months of Age Children in Low Stimulation Environments Have Less Connectivity in Executive Function Areas of the Brain



### 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



# SAM

Self-Regulation  
Self-Control  
Attention  
Working Memory  
Cognitive Flexibility

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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 Schwartz, 2014; Bryce et al., 2015) 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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## 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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## Physical Activity is Associated with Enhanced Cognition

Advancements in use of fMRI, diffusion tensor imaging (white matter), EEG (ERPs) and biometric measures (VO2 max) have strengthened the neuroscientific rationale for the beneficial effect of physical exercise and fitness on brain development and cognitive functioning in children and adolescents.

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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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### 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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### 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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Let's Do a 1 Minute Alerting Activity

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CogniTap Desk Moves: Set 1

**Toe Floor Taps**

L R L R L R L R

L R L R L R L R

1	§	2	§	3	§	4	§
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**Hand Table Taps**

R L R L R L R L

L R L L R L R R

1	§	2	§	3	§	4	§
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Sequential

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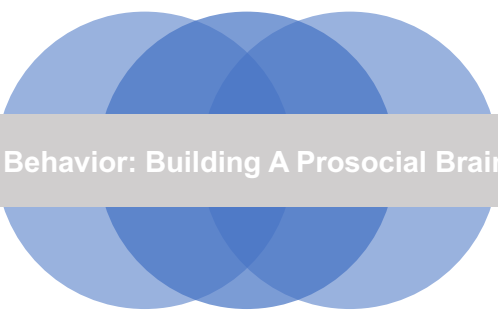
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Behavior: Building A Prosocial Brain

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### Stress, Brain Stimulation and Readiness to Learn

Children need low-stress high caring environments for optimal learning.

Resting state coupling between the amygdala and ventromedial prefrontal cortex is related to household income in childhood and indexes future psychological vulnerability to stress, Hanson et al., 2019.

Poverty as a Predictor of 4-Year-Olds' Executive Function: Poverty and poverty-related stressors are generally associated with higher allostatic load, lower executive function ability, and compromised self-regulation for young children, Raver et al., 2017.

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### Early EF Predicts Social Competence

Social competence is understood as the repertory of abilities that allow people to contend with the demands of a social situation in an acceptable manner (McLoughlin, 2009); to initiate and sustain cooperative and positive social interactions; as well as to know how to resolve conflicts or make friends (Hubbs-Tait, Osofsky, Hann, & Culp, 1994) in Romero-López et al., 2018.

Inhibitory control and cognitive flexibility are key developing skills in preschoolers, Buttelmann & Karbach, 2017.

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### Create a Classroom Culture of Kindness, Respect & Trust

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## Behavior

### It's WHAT WE ATTend To

Students who "misbehave"  
 Students who "act out"  
 Students who "want attention"  
 Students who "do not pay attention"  
 Students with "who are lazy"  
 Students who "are a distraction"

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## The ONE Important Thing

98% of the time, it's a skill deficit,  
 it's NOT non-compliance

Trauma	Frustration
Learning Difficulties	Not feeling understood
Violence	Not feeling heard
Miscommunication	Executive Function
Misunderstanding	Dysfunction
Sensory overload	Mood Regulation
Agitation	Self-Regulation
Anger	Motor Skill Deficits

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## The Discipline Trap

Believing we  
 can  
 Consequence  
 children into  
 new prosocial  
 skill sets




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## Damage Control

Waiting for the behavioral disruption to appear before intervening.

Prepare, Partner,  
Practice and  
Prevent

### Damage Control

When are we in it?

Describe the circumstances or situation.

How do you know you were in damage control?

What were you thinking? What were you feeling? What were you doing?

How did you manage the moment?

What is your plan to stay out of damage control next time?

**BLOOM**  
Blossoms & Blooms  
@kidslusions @dylmekerney

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## What the Science Tells Us We Can Do Instead

### We become Detectives and look at:

- What does the behavior say?
- What are the skill deficits?
- What are the triggers?
- What puts the student into overwhelm?
- What can We do to prepare & prevent?
- What can WE do to remain calm & connected?

ONLY then can we begin to better build a prosocial brain

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## Build a Pond

### Build A Pond

**WHAT IS THE POND?**  
The pond of good behavior is the place children go to find new thoughts, words and behaviors, when they need a better - more prosocial - choice. Many times a child does not have alternate words or behavior to make a better choice in a situation. When you build a pond of good behaviors, the child can go to the pond and look for a new behavior or words to use for happier family living.

**HOW DO YOU BUILD THE POND OF GOOD BEHAVIOR?**

**Step 1:** Get a large poster board, markers and pens.

**Step 2:** Gather the family together and talk for a moment about how you've been noticing a lot of good happening in your family. Introduce the concept that you want everyone to live a "detoxed" life for a few days and write down all the smart choices family members are making. You'll end up with about 500 behaviors in "helped sister find shoes" and said, "May I help you clean up?" "Waited for mom to sit down before dinner." "Shared a favorite toy." "Chose to be calm instead of yelling."

**Step 3:** Print out and cut out the fish, as a family. Write or draw behaviors, on the fish. Do not assign a person's name, simply write good behavior. Next time you face a challenge your child has a place to choose better choices.

**Step 4:** Now you have a pond in which each family member can "fish" for better behavior instead of being sent to time out or being punished.

**Step 5:** Sincerely compliment the specific behaviors.

**BLOOM FAMILY WORKBOOK**

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### What Time is it?



- |                              |                                       |
|------------------------------|---------------------------------------|
| Time to Validate             | Time to Co-Regulate                   |
| Time to Empathize            | Time to teach a New skill             |
| Time to Calm Down            | Time to use a Cue                     |
| Time to BE the child's Brain | Time to use a pre-determined Strategy |




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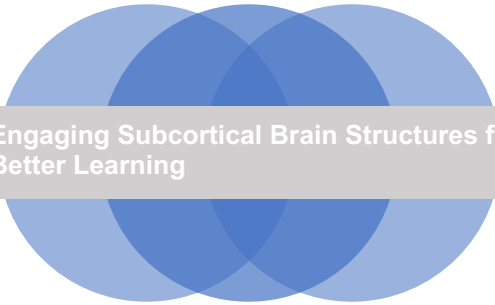
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### Engaging Subcortical Brain Structures for Better Learning




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### PRIME the Brain for Learning

Vestibular  
 Proprioceptive  Balance  
 Kinesthetic Posture  
 Weight Shift  
 Beat Competency

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## Our vestibular system is like a gyroscope for the body

Depending on how we move our head (rotation/direction/speed), specialized cells send signals to our brain which then 'informs' our body's reaction

A well-functioning vestibular system:

- Better balance
- Less clumsiness
- Better visual tracking
- Better head-eye coordination
- Smoothly look up at a whiteboard, then down at their work
- Reading fluidly, finding next line of text
- Ball skills
- Better posture and muscle tone
- Language development via integration of visual and auditory senses
- Promotes self-regulation

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## Balance, Weight Shift & Posture

Let's Drive a Car

Let's Be a Crane

The Posture Song

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## Posture

### The Ready Position Song

Head Shoulders Hips and  
Knees  
Hips and Knees  
Head Shoulders Hips and  
Knees  
Hips and Knees

Chin up tall  
Belly in and  
Tailbone down

Head Shoulders Hips and  
Knees  
Hips and Knees

Pre-K4th Self-Song: Self-Control, Attention, Memory, Fine Motor, Classroom

©JennyMcIntyre 2005, 2010

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## Proprioception and Kinesthesia

**Kinesthetic sense.** The ability to know accurately the positions and movements of one's skeletal joints. Kinesthesia refers to sensory input that occurs within the body. Postural and movement information are communicated via sensory systems by tension and compression of muscles in the body.

**Proprioceptive senses** relay information about the position and movement of our limbs and trunk, the sense of **effort**, the sense of **force**, and the sense of **heaviness**. Receptors involved in proprioception are located in skin, muscles, and joints.

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We've Got the Beat

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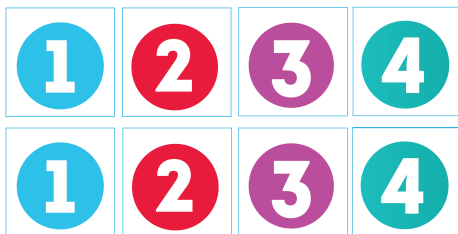
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### Let's Count




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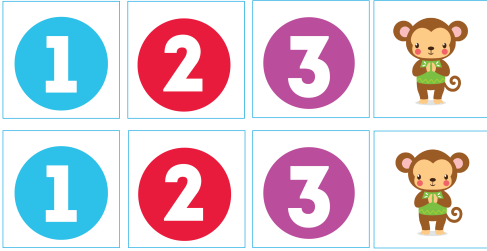
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Let's Clap




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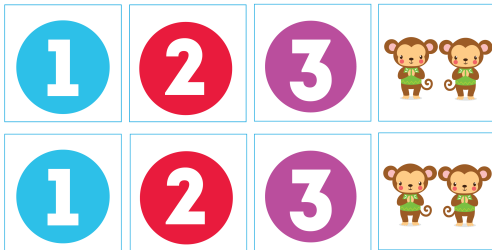
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Let's Clap Clap




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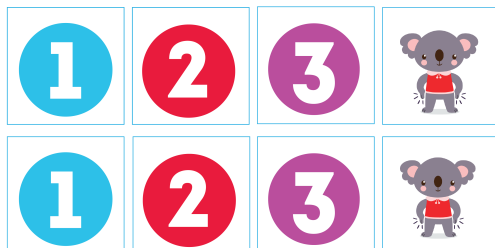
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Let's Pat




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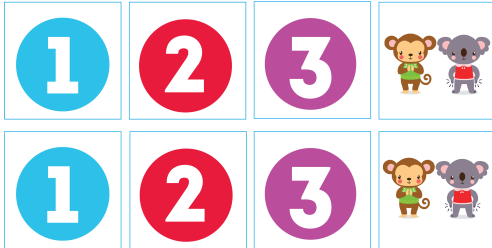
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Let's Clap Pat




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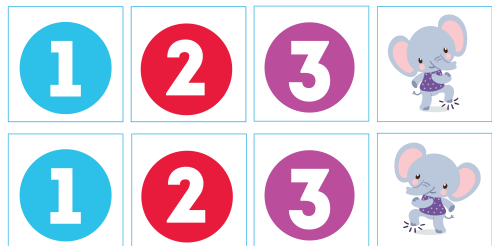
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Let's Stomp Right, Left




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Let's Pat & Stomp




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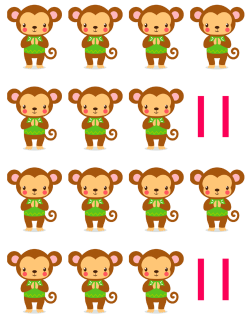
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## Let's Pause




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## Traveling Beats




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## Balance, Beat and Coordination

A systematic review of the research suggests that short bursts of fine and gross motor coordinated bilateral physical activity may improve attention, processing speed, and focus, van der Fels et al. 2015.

In a systematic review of research studies on the impact of physical activity on attention, deSousa et al. 2018 observed that continuous exercises that required greater cognitive involvement like activities with coordination and balance were related to a better performance during attention-demanding tasks than continuous exercises with fewer or no cognitive challenges (Budde et al., 2008; Palmer et al., 2013).

Bonacina et al. 2019 reported the use of clapping in time training as a way to possibly affect a broad spectrum of rhythmic abilities that are linked to language and literacy processes.

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Classroom physical activity benefits students by:

- Improving their concentration and ability to stay on-task in the classroom.
- Reducing disruptive behavior, such as fidgeting, in the classroom.
- Improving their motivation and engagement in the learning process.
- Helping to improve their academic performance (higher grades and test scores).
- Increasing their amount of daily physical activity.

Centers for Disease Control, 2018

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## Musical Thinking

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Alerting Attention	Memory Strategy	Time Allocation
Applying Past Knowledge	Motor Management	Time Estimation
Balance	Motor Planning	Time Monitoring
Cognitive Flexibility	Motor Sequencing	Visual Scanning
Cognitive Persistence	Narrative Language	Working Memory
Coordination	Organization	
Creative Thinking	Planning	
Critical Thinking	Previewing	
Decision Making	Prioritizing	
Emotional Regulation	Problem Solving	
Exploration	Project Planning	
Focused Attention	Reflection	
Impulse Control	Rhythm	
Inhibition	Sustained Attention	
	Task Management	

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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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“Executive Functions  
are Cognitive Skills  
and Cognitive Skills  
can be Learned.”




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**5 SIMPLE STEPS**  
To Teaching Children  
How They Think

The Quick Start Manual

By Lynne Kenney, PsyD  
Executive Director, Musical Thinking

Musical Thinking is a cognitive empowerment strategy utilizing music, movement and rhythm that teaches children how they think and learn helping them gain better control over their approach to daily tasks and activities related to learning and behavior.

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THINK Better Learn More

### Improving Executive Functions

Executive functioning (EF) is a collection of self-regulatory control processes that are divided into core domains of working memory (i.e., maintain/manipulate data not perceptually present), inhibition (i.e., inhibit or control of attention, thoughts, behaviors), and flexibility (i.e., shift flexibly between tasks/sets; Diamond 2013; Miyake et al. 2000; Kavanaugh et al., 2018).



Self-Control Attention Memory

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### 8 Musical Thinking Executive Function Brain Lessons

1. I am Musical
2. I am the Best Coach for My Own Brain I
3. I Move to Learn
4. Neuronal Highways
5. How My Brain is Built
6. My Attention Engine
7. My Memory Window
8. I am the Best Coach for My Own Brain II

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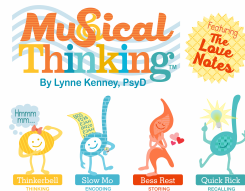
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### I am Musical

We Walk to the Beat  
We Move to the Beat  
We Learn to the Beat  
We Regulate to the Beat




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## Rhythm, Tempo + Timing

Motor rhythm and timing are precursors to behavioral and academic learning. Further, patterning which is a central element of learning, coincides with tempo, rhythm and timing in both reading and math, Center on the Developing Child - Harvard, 2015.

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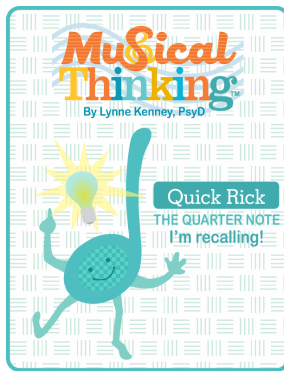
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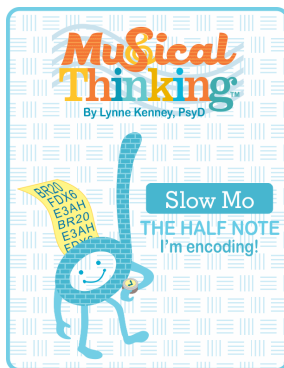
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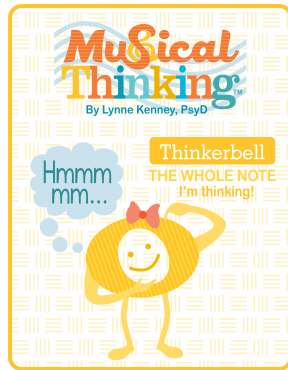
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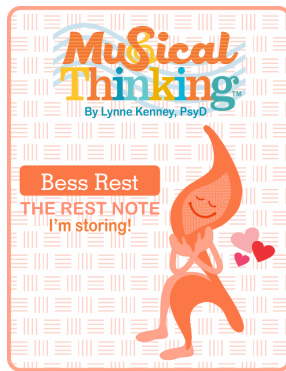
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### Musical Thinking Communication Signals

#### Pause

Fists gently placed in front of the body next to one another palms down, waist high.

"Please wait a moment, I'm Thinking."

Index finger gently pointing to head temple high.

"May I please get up for some movement now?" (mini-break)

Index finger spinning upward.

"May I please take a moment to Bess Rest?" (I am overwhelmed, tired or needing to take a breather and calm myself for a moment.)

Upper body hug, arms crossed to shoulders.

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Building Your Own Patterns, Sequences & Rhythmic Phrases

Darrell Williams

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Let's Build Some Patterns

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<b>Clap</b>	<b>Hand Tap</b>	<b>Pat</b>
<b>Tap</b>	<b>Step</b>	<b>Stomp</b>

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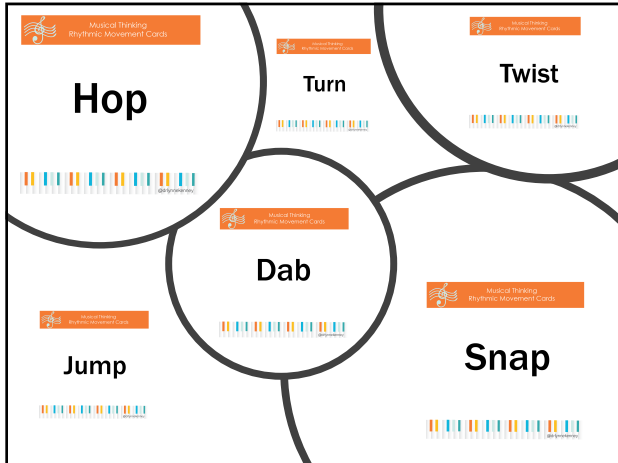
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### Cueing is Scaffolding

Auditory cueing could also lead to a different type of motor learning process by providing a richer setting for motor learning and stimulating connectivity between auditory and motor areas. Rather than simply speeding up learning, motor activation would result in a different learning process than uncued movement. (Schaefer, 2014).

Counting  
Saying what you are doing  
Right, Left  
1 Clap 3 Bounce  
Words in motion – bounce, catch, pass

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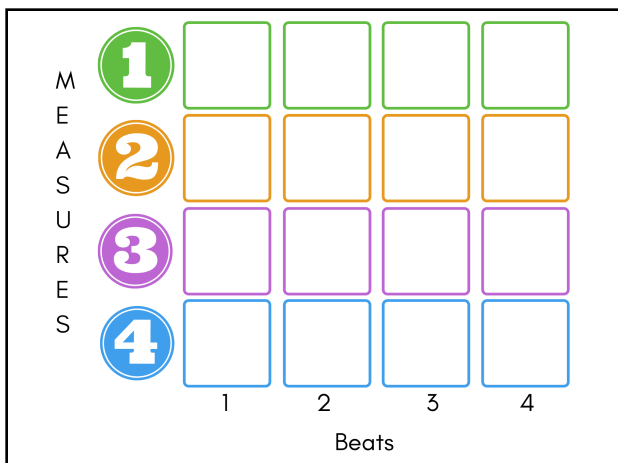
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<b>1</b>				
<b>2</b>				
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Beats

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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 and Response Inhibition are about Learning the "Felt-Sense" of Slowing Down





Slow 50-85 BPM Quick 85-120 BPM Fast 120-160 BPM

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Effective transitioning of students between learning activities occurs when teachers establish routines and expectations of student movement and behavior wherein students stop one activity and quickly and smoothly move to the next activity. Effective student transitions increase learning time and provide daily practice of safe movement (Carter, 2017).

Orderly transitions in school also increase the time that could be committed to classroom teaching and learning. Daniel (2007) identifies that even 10 minutes a day (a conservative estimate) of lost classroom time due to student disruptions and poorly executed transition adds up to a staggering 30 hours of lost class time per school year.

Reducing the transition time before and after activities by just one minute per hour could reclaim 20 hours of lost time-on-task per student, per school year (Carter, 2017).

Improving student time-on-task while transitioning supports more teaching time and imparts important self-regulation and executive function skills to last a lifetime.

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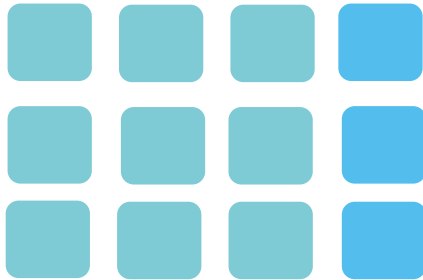
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1 2 3 Freeze




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Don't Forget to Pause




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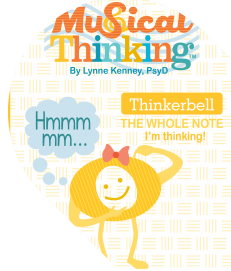
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## I am the BEST COACH for My Own Brain I

"When we make the application of executive functions to learning transparent and easily understood, children gain better control over what was previously mysterious to them, that is, *the process of thinking and learning.*"




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## I Move to Learn

- My body moves to help me concentrate
- I need to recognize when I need to tap, pat or move to re-alert
- Sometimes I need to calm not energize
- What's My PLAN
- What are my go-to activities?

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Cognitive Science

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### The Paths Most Travelled

We begin with pathways. We travel them over and over again until they grow into roadways and then highways.

We build Neural  
Connections




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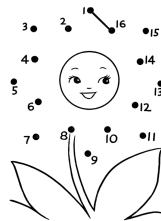
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## Neuronal Highways

### Neuronal Highways

- Pathways to Highways.
- Repetition and Practice.
- Highways improve learning and behavior. "Let's make this easier."




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### Your Hand Your Brain

#### 3 Primary Parts

The THINKER The  
CAVEMAN and  
BOOTS

"Engage Your THINKER  
not your Worrier."

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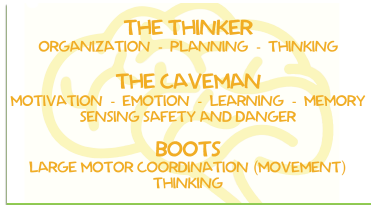
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## 5 How My Brain is Built




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### Cognition is Mediated by the Cerebellum

"When we consider brain anatomy, we recognize the importance of the integration of the cortical and subcortical structures of the brain in learning and behavior. We need to keep front of mind that the higher level cognitive systems, rest on the subcortical structures including the limbic system and the cerebellum. Proper integration is needed for high quality learning. As the phylogenetically older of the brain systems, the cerebellum precedes the prefrontal cortex, in the automaticity of learning and behavior. Both are stored in and mediated by the cerebellum." (Kenney & Comizio, 2016)

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### Genes are Not Destiny

#### Depression & Anxiety

Choi et al. 2019, Harvard

#### Autism, Allergies, ADHD, Asthma

[www.neurologicalhealth.org](http://www.neurologicalhealth.org), ASU

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## 6 My Attention Engine

Talking about My Attention Engine and the Attention Cycle May Improve:

- Student metacognition
- Student mindful awareness
- Student awareness of their attention engine
- Student awareness of their attention cycle
- Student ability to focus, in order to take in information necessary for learning
- Ability to choose salient targets of attention
- Ability to sustain focused attention
- Ability to recognize when they drift
- Strategies to re-alert, re-select and re-attend
- Student-derived cognitive strategies
- Student empowerment and confidence
- Student agency and participation
- Classroom social cohesion
- Student prosocial behavior




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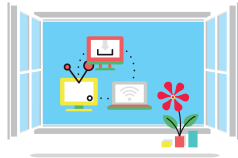
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## 7 My Memory Window

My Memory Window



We all have a window in our brains to our memory.

In order to open the window to our memory, we need to turn on our attention engines.

When we rev-up our engines, then focus on our target, we listen to or see what we need to learn.

Our attention engines open the window to our memory so that information may pass through it. As we learn the new information we turn it into knowledge.

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## 8 I am the Best Coach for My Own Brain II

- I understand that I need practice and repetition to build the connections in my brain
- I understand that my THINKER rests on my Caveman and Boots
- I know that Attention is more than ONE thing
- I know I need to OPEN my memory window to let information in to become knowledge
- I understand that sometimes I need to move to THINK
- I will ask for help when I need it, I have a language now to do that

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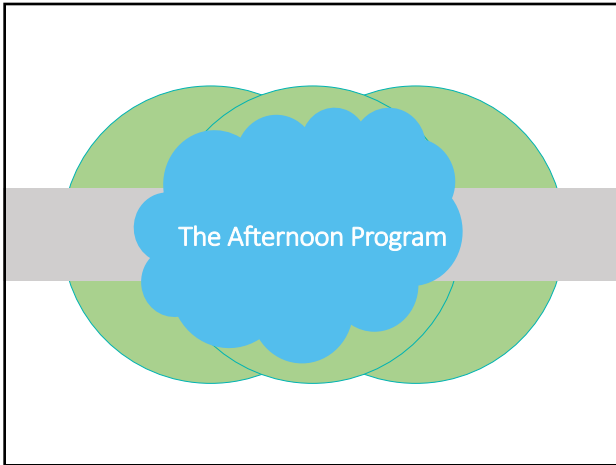
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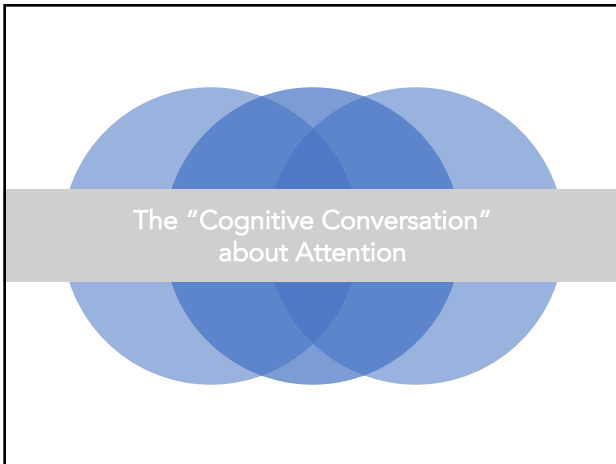
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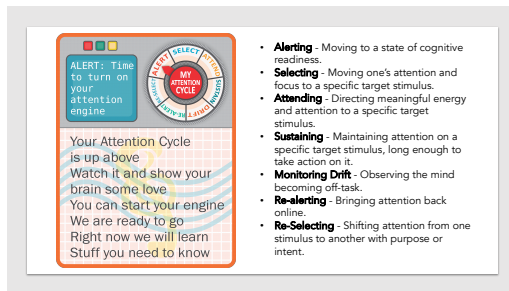
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### Get the Conversation Started Prompts:

- What is attention?
- What makes it easy to pay attention?
- What makes it difficult to pay attention?
- What are the parts of the attention cycle?
- How do you turn on your attention engine?
- What helps your attention engine run smoothly?
- What does it mean to be alert?
- When does your attention need a break?
- What makes your brain drift?
- When you drift where do you go?
- What distracts you?
- What helps you remain focused?
- What do you tell yourself when you brain needs a break?
- How long do you think a brain breather should last?
- How do you re-alert your attention?
- What do you say to yourself to re-alert your attention?
- Are there ways we, as a class, can help one another remain alert?

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### Selecting and Attending Prompts:

- How do you use your headlights to choose the proper target of your attention?
- What do you see, think and hear when you select different targets of your attention?
- Can you show me how you direct your headlights to the person, place or thing you are to focus on now?
- What do you tell yourself about selecting the proper focus of your attention?
- How do you know if your headlights are off-target?
- Attending is directing your mental energy toward a specific target.
- Can you show me what attending looks like?
- If I am the target of your attention, what will you look like when you are attending to me?
- If your book is the target of your attention, what will you look like when you are reading?
- If a classmate is the target of your attention, what will you look like when you are attending to your classmate?

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Mrs. Johnston's Cognitive Classroom

<p><b>I am My Brain's Best Coach</b></p> <p>Ways to turn my TORCH On! (alert)</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>	<p><b>I am My Brain's Best Coach</b></p> <p>Ways to draw My Attention to a specific target (select)</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>
<p><b>I am My Brain's Best Coach</b></p> <p>Ways to help me FOCUS (attend) during the day</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>	<p><b>I am My Brain's Best Coach</b></p> <p>My favorite ways to "switch off" and take a break (drift)</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>

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Hey Attention!

Hey **ATTENTION**, how are YOU?

*Wake up* we have much to do

**FOCUS** on what's important

Turn on your headlights take it in

Thank you **ATTENTION** you are my friend

Now the learning is about to begin

Self-Control Attention Memory

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Wait!

*Wait, wait, wait it out*

**THINK ABOUT IT FIRST**

Before you do anything

It's *smart* to think it out

When you **get the urge to act**

You can **wait and think**

All the possibilities

Result in different things

You want what you do

To be good for all

**When you wait and you think**

Things will turn out well

Self-Control Attention Memory

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## Seated Work For Better Attention

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CogniTap Desk Moves: Set 2

**Toe Floor Taps**

R L R L R L R L

L R L R L R L R

1 § 2 § 3 § 4 §

**Toe Floor Taps**

R L R L R L R L

R R L L R R L L

1 § 2 § 3 § 4 §

Sequential

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CogniTap Desk Moves: Set 3

**Hand Table Taps**

R L R L R L R L

L R L R L R L R

1 § 2 § 3 § 4 §

**Toe Floor Taps**

R L R L R L R L

R R L L R R L L

1 § 2 § 3 § 4 §

Sequential or Simultaneous

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CogniTap Desk Moves: Set 4  
**Tap & Claps**

Tap	Clap	Tap	Clap	Tap	Clap	Tap	Clap
RF		LF		RF		LF	
Tap	Clap	Tap	Clap	Tap	Clap	Tap	Clap
LF		RF		LF		RF	

1 §
2 §
3 §
4 §

Clap	Tap	Tap	Clap	Tap	Tap	Clap	Clap
	RF	LF		RF	LF		
Clap	Tap	Tap	Clap	Tap	Tap	Clap	Clap
	RF	LF		RF	LF		

1 §
2 §
3 §
4 §

Sequential

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Right Toe Tap

Left Toe Tap

Right Hand Tap

Left Hand Tap

Clap

Left Heel Tap

Right Heel Tap

Both Hands Pat

Rest - Be Still

CogniTap SPOTS:  
The Visual-Motor Code

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CogniTap SPOTS: Pattern 1

1 §
2 §
3 §
4 §

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CogniTap SPOTS: Pattern 4



1 § 2 § 3 § 4 §

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CogniTap SPOTS: Pattern 5



1 § 2 § 3 § 4 §

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Music, Piano and Drumming for  
Cognitive Engagement

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## How Rhythm and Music Enhance Cognition

Learning includes recognizing, understanding and responding to patterns and sequences.

- Tasks of daily living, dressing, cooking, walking to school, playing
- Reading & writing
- Numeracy
- Spelling and vocabulary
- Homework and projects require sequencing

Rhythm and Tempo provide the opportunity to anticipate, respond, and create.

Timing supports and enhances coordination which underlies cognition.

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## Benefits of Music & Movement Training

Music and movement instruction has been shown to engage children's memory, cognitive development, social skills, learning and auditory processing.

(See - Dumont 2017; Miendlarzevska, & Trost, 2014)

- Develop fine motor skills
- Develop gross motor skills
- Learn to express emotions
- Learn how to manage one's body in space
- Improve balance and coordination
- Improve social interaction
- Improve self-regulation
- Increase working memory load
- Increase selective attention

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## Music and Movement in Curriculum

Integrating music and movement into the curriculum, has shown to directly affect numerous areas, including recall, reading levels, mathematics skills, engagement, and motivation (Cole & Boykin, 2008; Vazou, Gavrilou, Mamalaki, Papanastasiou, & Sioumala, 2012; Jensen & Kenny, 2004; Iwasaki et al., 2013; Mendelson, Greenberg, Dariotis, Gould, Rhoades, & Leaf, 2010; Song, Capraro, & Tillman, 2013), Hall 2019.

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## Meludia Paris




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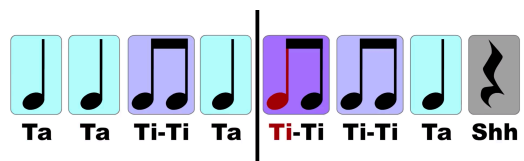
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### Repeat the Beat & Pass the Beat

1 2 3 4

1 + 2 + 3 + 4 +

1 e + a 2 e + a 3 e + a 4 e + a

1: e + a 2 e + a 3 e + a 4 e

1 2 3 4; Pause 2 3 4

1 2 ; 1 2 3

1 2 3 ; 1 2

1 2 3 ; 1 2 3

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## Language, Dyslexia, Reading and Learning

Developmental dyslexia is a childhood learning difficulty that is defined as a specific difficulty in reading and spelling that cannot be accounted for by low intelligence, poor educational opportunity or obvious sensory/neurological damage.

The core cognitive difficulty in developmental dyslexia lies with phonology, as measured by the ability to reflect on the sound structure of words (Snowling, 2000).

Children with dyslexia have difficulty in manipulating sound elements in words and in recognizing shared sounds in words (Ziegler & Goswami, 2005; Ziegler et al., 2010, for recent reviews).

They frequently also have difficulties with phonological short-term memory and rapid naming of familiar word forms (Wagner & Torgesen, 1987; Ziegler et al., 2010).

More recent studies show that the phonological difficulties in dyslexia extend **beyond single words to the processing of intonation, syllable stress, speech prosody and speech rhythm** (e.g. Goswami, Gerson, & Astruc, 2010; Goswami & Leong, 2013; Goswami et al., 2013b; Leong, Hämäläinen, Soltész, & Goswami, 2011).

Source: Bishop-Liebler et al. 2014

## D Y S L E X I A

- **1 in 16** public school students have IEPs for specific learning disabilities (SLD) or other health impairments (OHI), which covers ADHD. Source: NCLD
- Dyslexia affects an estimated 5%-17% of schoolchildren, depending on the cutoff reading score used to diagnose the disorder.
- It is estimated that 30% of those with dyslexia have coexisting ADHD (primarily inattentive type). Source: IDA
- Over 80% of children with ADHD and 60% of children with a Reading Disability meet the criteria for at least one additional diagnosis (Willcutt & Pennington, 2000a, 2000b).
- Intervention is most successful if it begins before 4<sup>th</sup> grade, although people with dyslexia can successfully receive treatment into adulthood.
- If the student is below the 38th percentile nationally in reading, lifelong challenges may result.

## Literacy Ladder

Reading For  
ComprehensionReading  
FluentlyDecoding Skills  
(Sound Symbol &  
Phonics Instruction)Phonological  
ProcessingPhonemic  
RepresentationsWellington-Alexander  
CENTER  
FOR LITERACY ASSESSMENT & INTERVENTION

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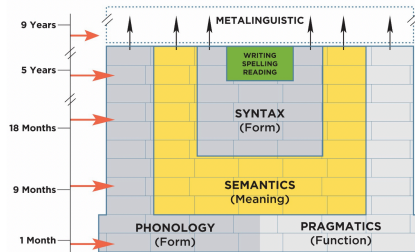
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Development of the Language System  
THE BUILDING BLOCKS OF LANGUAGEWellington-Alexander  
CENTER

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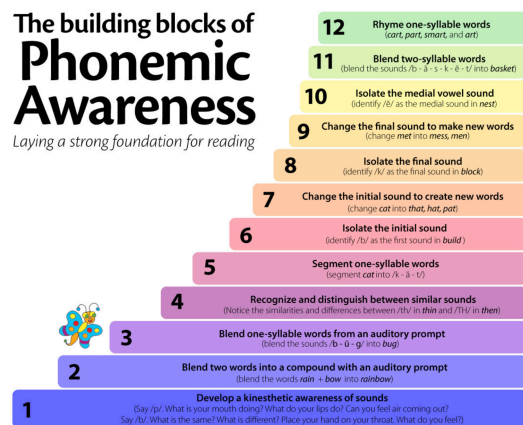
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The building blocks of  
**Phonemic Awareness**

Laying a strong foundation for reading




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## Dyslexia: Early Intervention is Key

- **Dyslexia** is a specific learning disability that is **neurobiological** in origin.
- Research has shown that brain plasticity decreases through childhood. It takes 4 X as long to intervene in fourth grade as it does in late kindergarten (NICHD) because of brain development and due to the increase in content for students to learn as they grow older.
- Children at risk for reading failure can be reliably identified even before kindergarten.
- "Deficits in phonological awareness, rapid automatized naming, verbal working memory and letter knowledge have been shown to be robust precursors of dyslexia in children as young as age three" (Gaab, 2017). Extensive evidence exists that supports the fact that early intervention is critical.
- Struggling readers who do not receive early intervention tend to fall further behind their peers (Stanovich, 1986).

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## Early Intervention: Detect Earlier

- Know to look for the signs and symptoms of Dyslexia, ADHD and DCD
- Be mindful of 40%+ comorbidity
- Refer students for Dyslexia screening if the following are present:

	Never/ not at all	Rarely/ a little	Sometimes	Frequently/ quite a bit	Always/ a great deal
1. Has difficulty with spelling.	1	2	3	4	5
2. Has/had difficulty learning letter names	1	2	3	4	5
3. Has/had difficulty learning phonics (sounding out words)	1	2	3	4	5
4. Reads slowly	1	2	3	4	5
5. Reads below grade level	1	2	3	4	5
6. Requires extra help in school because of problems in reading and spelling	1	2	3	4	5

- Support a full dyslexia intervention if it is needed
- Use gestures and visual supports
- Maximize time outdoors for play + recess
- Add 5 minutes of cognitive-motor movement to your classroom every 45 minutes
- Look into Whole Brain Teaching

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## Why is Rhyming Important?

1. Rhyming teaches children about timing and meter in speech.
2. Rhymes help children begin to learn prosody, speaking and reading with expression.
3. Rhyming helps children make predictions related to speech sounds.
4. Rhyming while reading engages the visual and auditory centers of the brain.
5. Rhyming is fun and leads to social entrainment.

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### Musical Patterns & Sequences

Musical tempo, rhythm and timing are among the first patterning experiences children have, beginning when we play simple hand games like "Peek-a-boo" and "Pat-a- cake" as toddlers. We then move on to hiding games like "Where is thumbkin"? Next, songs and simple nursery rhymes like "I'm a little teapot," and "Itsy bitsy spider" introduce patterns in language and movement combined with response inhibition, attention and working memory.

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### Rhythm Matters in Reading

•Rhythm plays an organizational role in the prosody and phonology of language, and children with literacy difficulties have been found to demonstrate poor rhythmic perception, Lundstr   & Thompson, 2018

•Size and synchronization of the auditory cortex promotes musical, literacy, and attentional skills in children, Seither-Preisler et al, 2014.

•Rhythmic cues provide a regular temporal scaffolding supporting motor coordination Cochen De Cock et al, 2018.

•Responding to music helps improve self-control, as students anticipate changes in rhythm and tempo engaging their ability to wait, listen and respond Antonietti, 2018.

•Music provides structure to help students manage their internal timing according to variations in the external time of music while they synchronize behavior with external stimuli, Antonietti, 2018.

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### Play Matters Too

The children in our classrooms have lower language development, core, and physical skills than in the past, this impacts their executive functions which precede learning. They no longer swing on jungle gyms, swing on swing sets or play hopscotch and hand rhythm songs/games. Parents of young child need to know the research. Children need to get outside and play. They need to interact, draw, color, sing, dance, move and be connected.

The LiNK Project  : Effects of Multiple Recesses and Character Curriculum on Classroom Behaviors and Listening Skills in Grades K-2 Children - Rhea et al. 2018  
<https://www.frontiersin.org/articles/10.3389/feduc.2018.00009/full>

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Bean Bags, Attention, Memory and Inhibition

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**Cognibags**  
Alerting, Calming, Memory,  
Response Inhibition and Cognitive Flexibility



Cognibag One Bag  
Two People

Patterns, Sequences  
and Constellations

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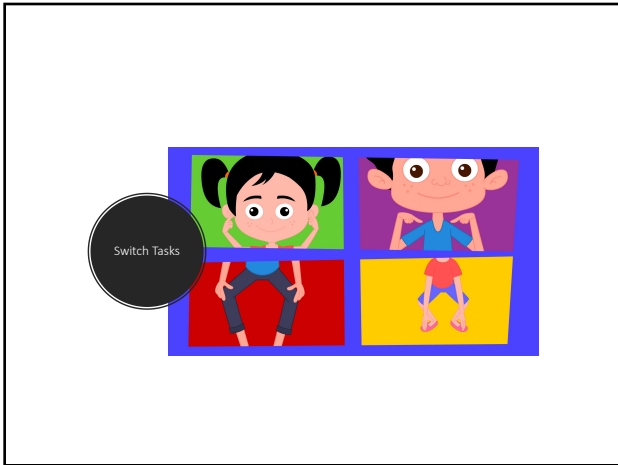
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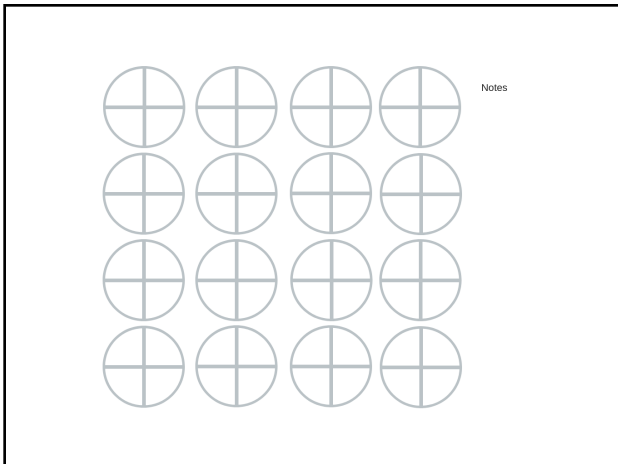
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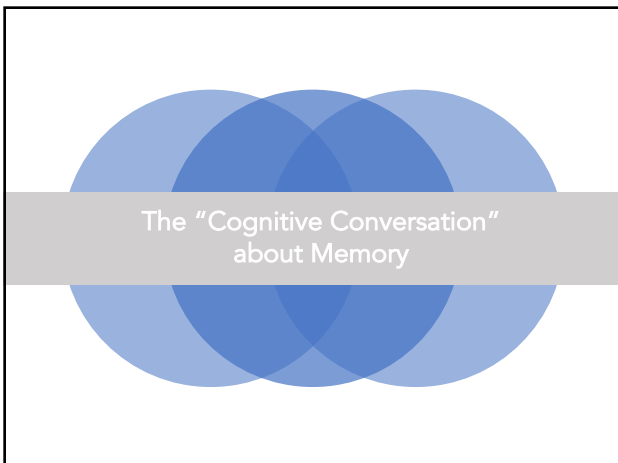
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### Working Memory

Working Memory involves storing, focusing attention on, and manipulating information for a relatively short period of time (such as a few seconds).

- Visual working memory is a cognitive system that maintains a limited amount of visual information so that it can be quickly accessed to serve the needs of ongoing tasks.
- Verbal (auditory) working memory is a memory mechanism that preserves a limited amount of speech-related information through repeated articulation, either overtly or subvocally, until the information can be used.

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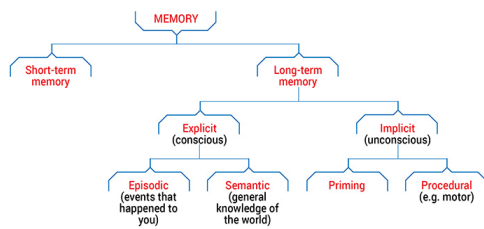
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Source: Queensland Brain Institute

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### Observed Challenges with Executive Function Skills

- Working Memory
  - Memory overload
  - Unable to "imagine"
  - Poor ability to visualize
  - Not sure how to encode
  - Does not know that practice leads to better retrieval
  - Cannot hold directions in their heads, may need to be told several times what to do
  - Salient details are clouded by unimportant information

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## Our Memory File Cabinet




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## How We Encode and Retrieve



Memory

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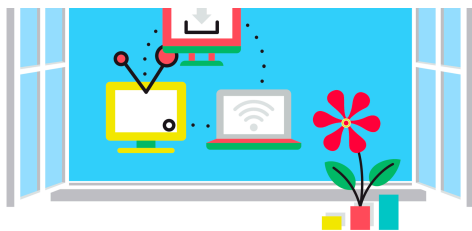
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We all have a window in our brains to our memory.

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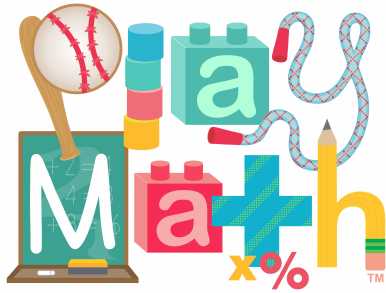
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The "Cognitive Conversation" about  
Self-Regulation, Response Inhibition  
& Self-Control

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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 may be especially important for academic and school success (McClelland et al., 2007a; Cameron-Ponitz et al., 2009; McClelland and Cameron, 2012).

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# SELF REG

The processes involved in self-regulation can be divided into three broad areas: **sensory regulation, emotional regulation and cognitive regulation.**

**Sensory Regulation:** Allows children to maintain an appropriate level of alertness in order to respond appropriately across environments to the sensory stimuli present.

**Emotional regulation** is the ability of an individual to modulate an emotion or set of emotions.

Explicit emotional regulation requires **conscious monitoring**, using techniques such as learning to construe situations differently in order to manage them better, changing the target of an emotion (e.g., anger) in a way likely to produce a more positive outcome, and recognizing how different behaviors can be used in the service of a given emotional state.

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Implicit emotional regulation **operates without deliberate monitoring**; it modulates the intensity or duration of an emotional response without the need for awareness. Source: APA

Cognitive regulation refers to the self-directed regulation of cognitions (thoughts, beliefs, affects) toward the attainment of goals. ... Some important processes are goal-setting, strategy use and adaptation, monitoring of cognition and performance, motivation (e.g., self-efficacy), and self-evaluation.

Cognitive regulation may also be referred to as self-control and effortful control.

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Someone who has good emotional self-regulation has the ability to recognize, identify and manage their emotions.

- This allows them to cope with the ups and downs of daily life without falling apart.
- They are able to shift their mood to a new state by employing positive coping skills.
- They are able to interact with others when over-energized by resisting responding with impulsive words, thoughts or actions.
- They experience a flexible range of thinking, communication and behavioral responses allowing themselves to adapt their thinking and behavior to best suit the task demands and stimuli in their environment.

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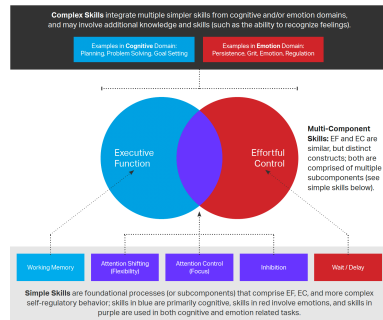
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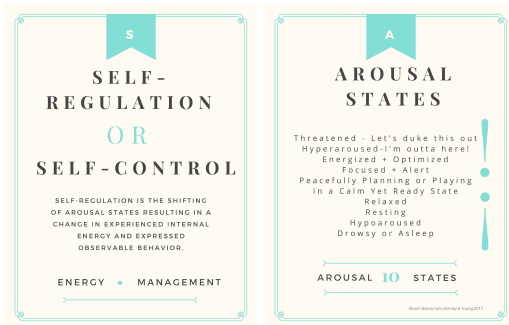
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**Umbrella Skills** refer broadly to this area of development and may be used to refer to many diverse skills (simple and complex, emotional and cognitive, plus others not listed here). Examples include self-regulation and self-control.



Source: James, S. M., Bailey, R., Ramirez, S. P., & Peltier, A. (2016). *Executive Function Mapping Project Executive Summary: Unraveling the Terms and Skills Related to Executive Function and Self-Regulation in Early Childhood*. CPRE Report # 2016-06. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.



## Regulate

Identify

Reflect

Employ

"We do things on purpose with intention."

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## Spotlight: The Visual-Motor Language

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## Move Before You Lose It

Children prone to inattention, agitation, and over-excitability are best to move before disruptive patterns emerge. Frequent movement allows for regulation of internal energy, alerting the attention system and mood management.

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# Spotlight

## Meet Spotlight

Spotlight is an engaging visually-based 5-minute physical activity program for students and adults (ages 5 and up) that engages attention, memory, self-regulation, and social interaction by requiring you to think while you move. Reading the cognitive-visual-language in order to move in a coordinative, rhythmic pattern engages cognition.

## The "Anyone, Anywhere" Visual Cognitive-Motor Activity

A flexible "for anyone" program, Spotlight can be implemented easily with no equipment, in a brief time-frame with little training. While we focus on school-aged children, we have adapted Spotlight for seniors, sports teams, and office settings.

## What are the Spotlights?

The Spotlights are colors that communicate one movement per beat, 4 beats to a measure, 16 beats to a page. We call each page an Element. Each Element consists of patterns of movement that participants can mix and match over time. As students develop better beat competency, you can add rhythm to your movements by adding pauses, doing movements in half-time or double time or by changing tempo.



## Musicality

You don't need to be musical to play Spotlight. Our experience doing Spotlight with hundreds of students is that the children are naturally rhythmic and creative, they will offer ideas or make suggestions almost immediately.

## The Color Code

Each color represents a move with a body part. Red = right foot, blue = left foot, yellow = both hands, purple = right hand, pink = left hand, and green = free move. You may move with the body part any way you choose. Initially, we step or stomp, clap and tap to get the activity started.

## Cognitive Cueing

While you are reading the Spotlights and moving together on the beat, it is helpful to use your voice to cue your movements. Cueing is like a scaffold for the brain, it enhances your ability to keep the beat.

# Spotlight

The Spotlights tell you which body part to use. They represent quarter notes in 4/4 time. Move to the Spotlights with a steady beat.



Red - Right Foot



Purple - Right Hand



Blue - Left Foot



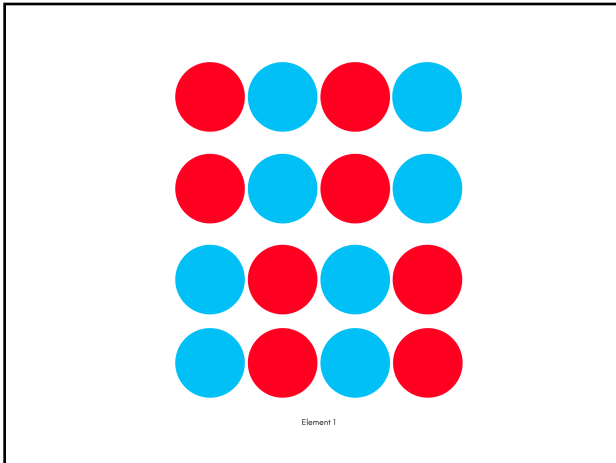
Pink - Left Hand



Yellow - Both Hands



Green Square - Free Move



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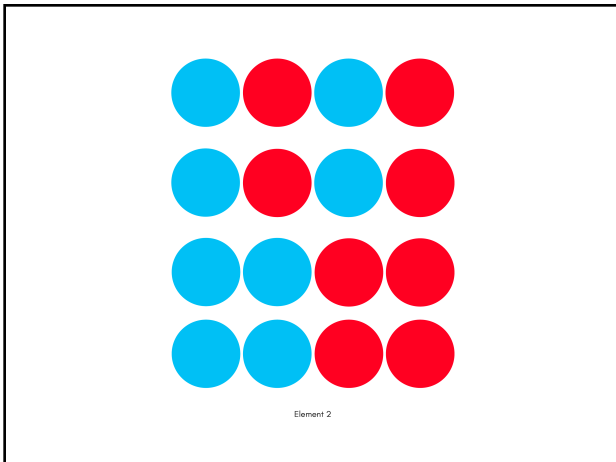
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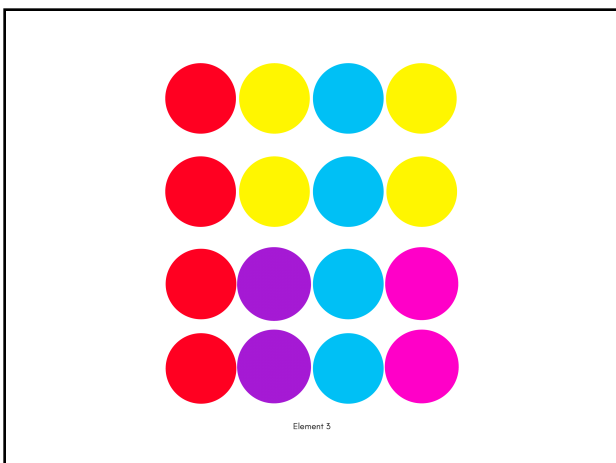
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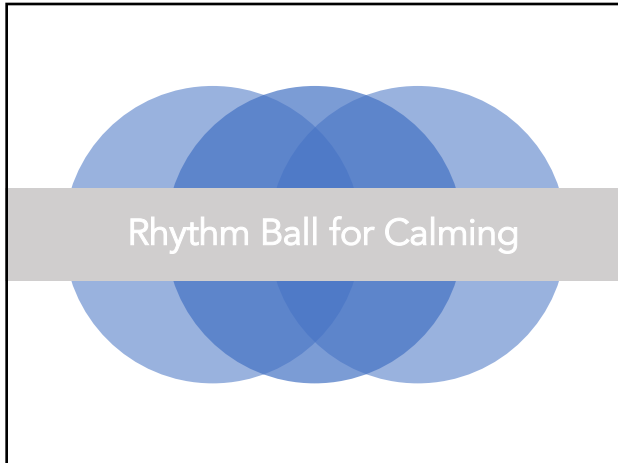
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Activity  
#16

Self-Regulation  
**RHYTHM BALL**

**DESCRIPTION:** Helping children establish their rhythm and timing often begins with teaching the children how to bounce the playground ball directly in front of themselves on their own. There are two ways to do this as the facilitator, you can stand across from the child or next to them giving verbal instructions and reinforcing their behavior with specific compliments regarding how they are holding the ball, how consistently they are pushing the ball and how well they are hitting the spot that is designated directly in front of them. It may work best if you bounce a ball at the same time as the student, while standing directly across from them or next to them. This will activate the brain and body's desire to entrain or synchronize, thus helping the child establish a clear beat.

You might also use some of the cues from Musical Thinking, asking questions such as "Shall we try it in Slow-Mo?" "What will the ball sound like if we bounce in Slow-Mo?" "Are we ready to try some Quick Ruck?" Always remember to authentically compliment the child when appropriate.

**RELATED SKILL SETS YOU MAY WISH TO EXPLORE WITH THE CHILDREN:**

<ul style="list-style-type: none"> <li>• Balance</li> <li>• Coordination</li> <li>• Impulse Control</li> <li>• Motor Management</li> <li>• Motor Planning</li> </ul>	<ul style="list-style-type: none"> <li>• Motor Sequencing</li> <li>• Rhythm</li> <li>• Sequencing</li> <li>• Successive Processing</li> </ul>
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### Self-Regulation FLIP 'N PUSH

**DESCRIPTION:** Teaching children how to bounce balls is a wonderful way to help them establish timing and sequencing. We have bounced balls with hundreds of children, many times, and find they do not know how to efficiently bounce the ball, so we teach them how to "Flip 'n Push."

**MATERIALS:** One racquetball.

**RELATED SKILL SETS YOU MAY WISH TO EXPLORE WITH THE CHILDREN:**

- Balance
- Coordination
- Impulse Control
- Motor Management
- Motor Planning
- Motor Sequencing
- Rhythm
- Sequencing
- Successive Processing

**GET READY:** Show the child how to stand with both feet firmly planted shoulder width apart, with toes facing forward, as if one is standing on a line.

**LET'S PLAY:** Hand the racquetball to the child and tell him we are going to practice how to bounce a ball. Holding the ball in a supine position, rotate the wrist over and push the ball to the ground. "See, I like the ball, flip it and push it." Now the child can imitate you with his own ball.

The child bounces the ball with his right hand eight times and transfers the ball to his left hand and bounces the ball with the same supine then rotating wrist technique. It's helpful to count the bounces with the child to ease consistent rhythm.

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### Self-Regulation THE ROCKING V

**DESCRIPTION:** There are many ways children can learn how to bounce balls. What we have observed with children is that they develop a preference for a certain size of ball, as well as a specific type of bouncing. Some children like to bounce the racquetball with one hand or from one hand to the other. Other children prefer the playground ball. Ball bouncing is both alerting and calming as it activates the body's natural inclination for rhythm. We have had children bring balls with them to restaurants to help them remain calm while waiting. We have had entire classes bounce balls before a test to alert their brains. We have also used balls in individual therapy, social skill work or executive function training for 5-8 minutes before we do our learning modules. The Rocking V is a calming activity that children like to do when they are anxious or have BIG feelings. It's a natural way to self-modulate.

**MATERIALS:** A racquetball.

**RELATED SKILL SETS YOU MAY WISH TO EXPLORE WITH THE CHILDREN:**

- Balance
- Coordination
- Impulse Control
- Motor Management
- Motor Planning
- Motor Sequencing
- Rhythm
- Sequencing
- Successive Processing

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### Swing, Sway, Swaddle, Sing, Hum

Yoga  
Meditation  
Tai Chi  
Movement in 3, 5, 7, 9  
Hydration  
Deep Breathing  
Stretching  
Rocking  
Pressure Point Hand Massage  
Yoga Ball Belly Rocking  
Heavy Work

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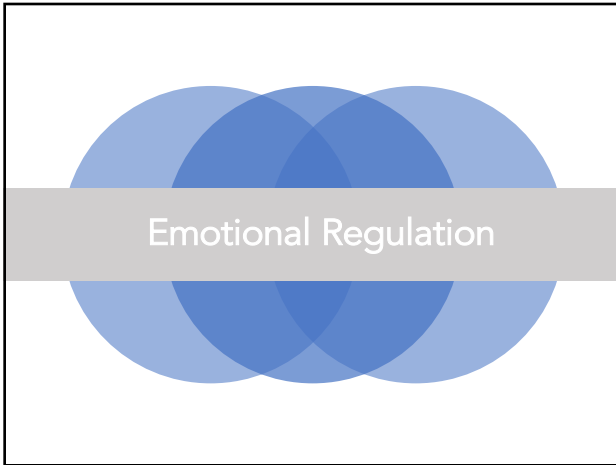
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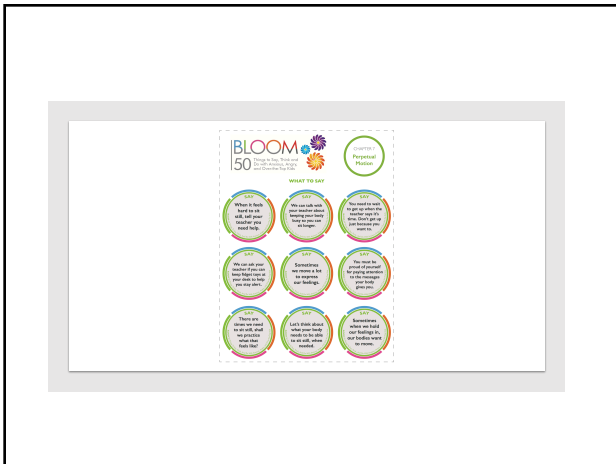
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Thinking  
**WHOSE JELLY BEANS  
AM I HOLDING?**

- Cognitive Flexibility
- Emotional Regulation
- Exploration
- Narrative Language
- Problem-Solving
- Reflection

[illegible]