# 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

# 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; Roebers 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

# Improving Executive Function: Evidence-Based Interventions

Cognitive Skills Training

Computerized Cognitive Training (CCT)

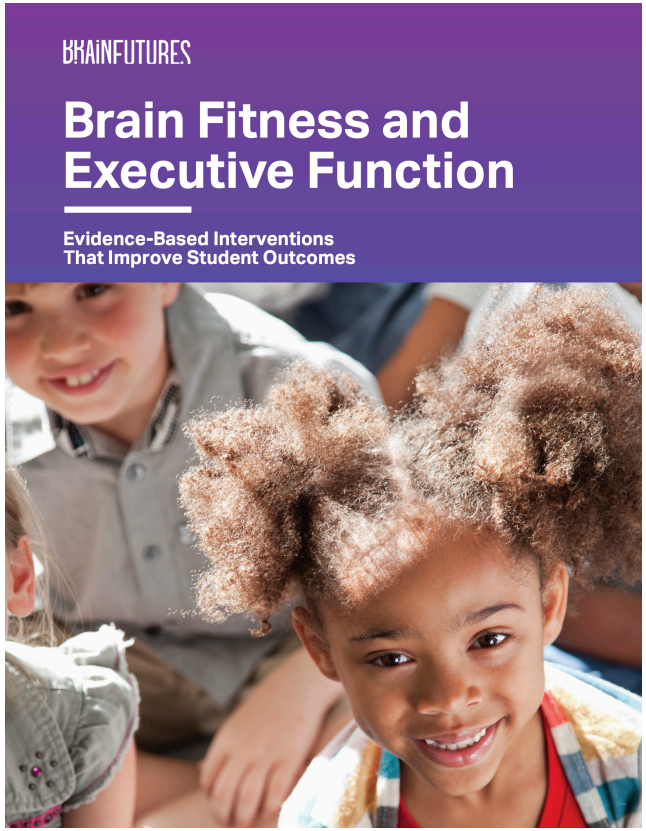
Social-Emotional Learning

Neurofeedback

Brain Literacy

Mindfulness

Physical Activity



# 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 at al., 2020; Favieri et al., 2019.

# 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 at al., 2020.

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

# 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.

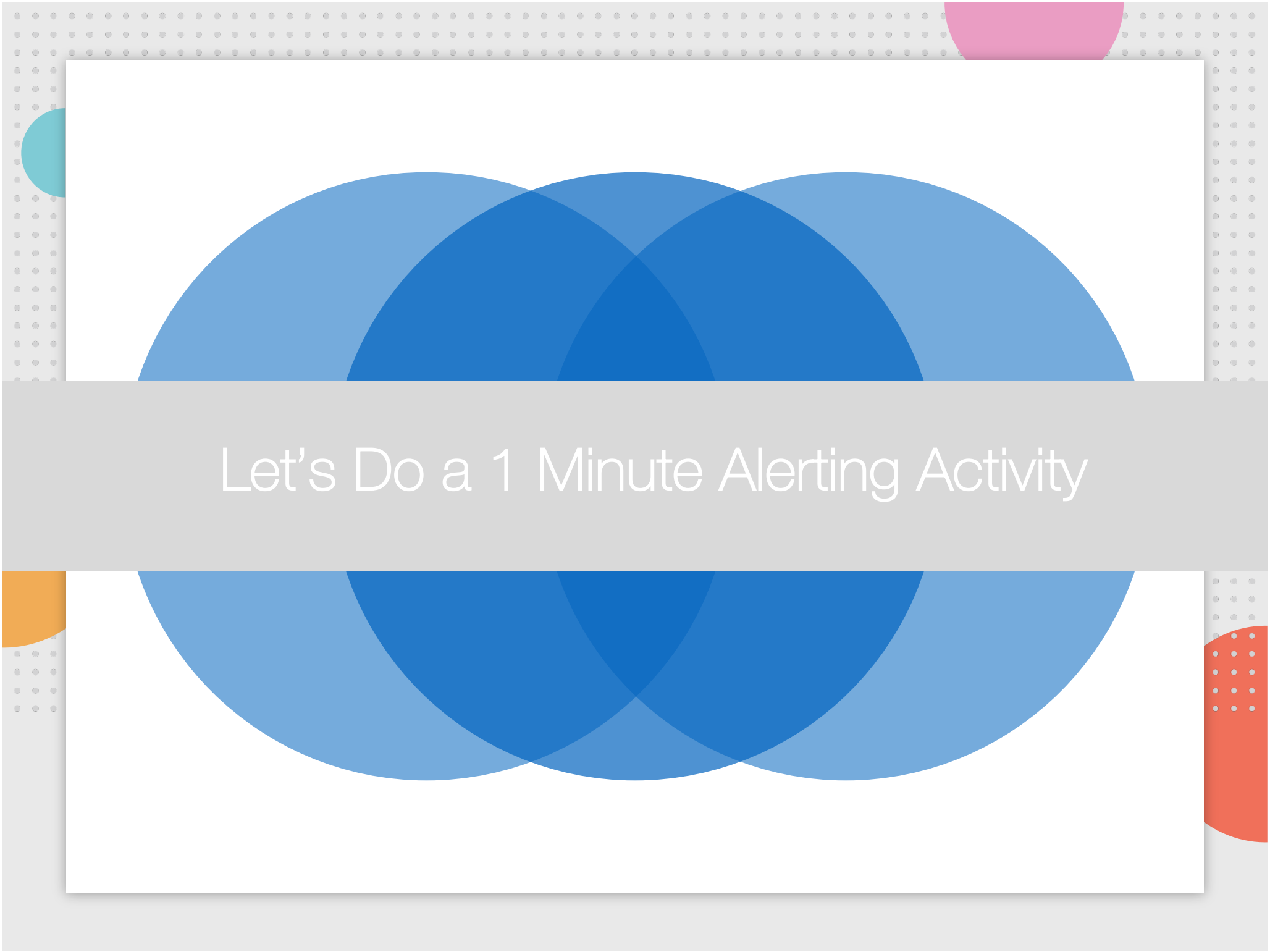
FITNESS and EF's – A growing body of research in children and adults indicates that higher levels of fitness are associated with better control of attention, memory, and cognition (Colcombe and Kramer, 2003; Hillman et al., 2008; Chang and Etnier, 2009).

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).

# 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 fitn ess on brain development and cognitive functioning in children and adolescents.


Let's Do a 1 Minute Alerting Activity

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 &

# Hand Table Taps

R L R R L R L L

L R L L R L R R

1 & 2 & 3 & 4 &

Sequential

# Behavior: Building A Prosocial Brain begins with Skill Development

# 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 at al., 2017.

# Create a Classroom Culture of Kindness, Respect & Trust

What does

look like,
sound like,
feel like?

# Behavior

# It's WHAT WE ATTend To

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

# The ONE Important Thing

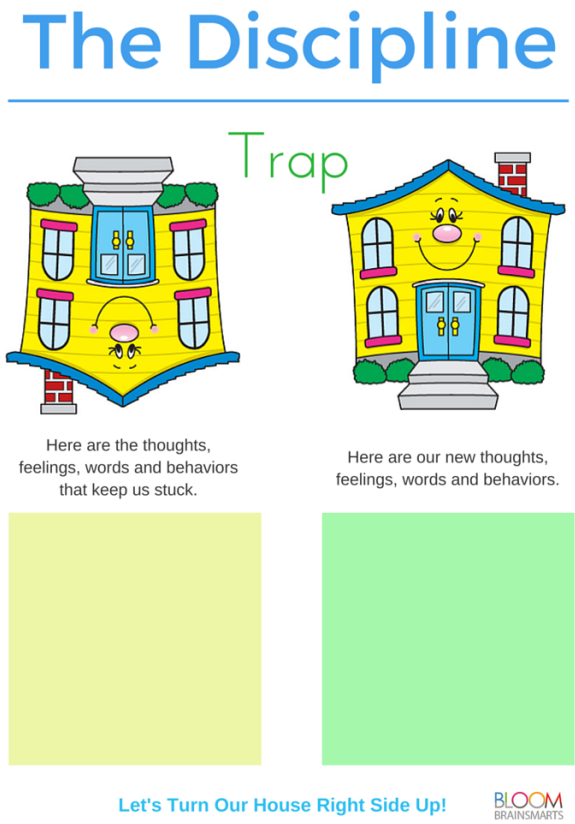
## 98% of the time, it's a skill deficit, it's NOT non-compliance

Trauma
Learning Difficulties
Violence
Miscommunication
Misunderstanding
Sensory overload
Agitation
Anger

Frustration
Not feeling understood
Not feeling heard
Executive Function
Dysfunction
Mood Regulation
Self-Regulation
Motor Skill Deficits

# The Discipline Trap

Believing we can Consequence children into new prosocial skill sets



# Damage Control

Waiting for the behavioral disruption to appear before intervening.

**Prepare, Partner, Practice and Prevent**


@kidlutions @drlynnekenney

# What the Science Tells Us We Can Do Instead

Understand that there are fundamental skills which precede learning and behavior.

## 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

# 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

SAY THINK DO

# 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 pro-social ~ 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 be a "detective" for a few days and write down all the smart choices family members are making. You'll end up with about 100 behaviors i.e "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 down 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.



# Engaging Subcortical Brain Structures for Better Learning

# 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.

# PRIME the Brain for Learning

Vestibular
Proprioceptive
Kinesthetic

Balance
Posture
Weight Shift
Beat Competency

# 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

# Posture

PreK-4th SAM Songs Self-Control Attention Memory The Kinetic Classroom

## 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

# Proprioception and Kinesthesis

**Kinesthetic sense**. The ability to know accurately the positions and movements of one's skeletal joints. Kinesthesis 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.


We’ve Got the Beat

# Let's Count

# Let's Clap

| | | | |
|---|---|---|---|
| 1 | 2 | 3 |  |
| 1 | 2 | 3 |  |

# Let's Clap Clap

| | | | |
|---|---|---|---|
| 1 | 2 | 3 |  |
| 1 | 2 | 3 |  |

# Let's Pat

| | | | |
|---|---|---|---|
| 1 | 2 | 3 |  |
| 1 | 2 | 3 |  |

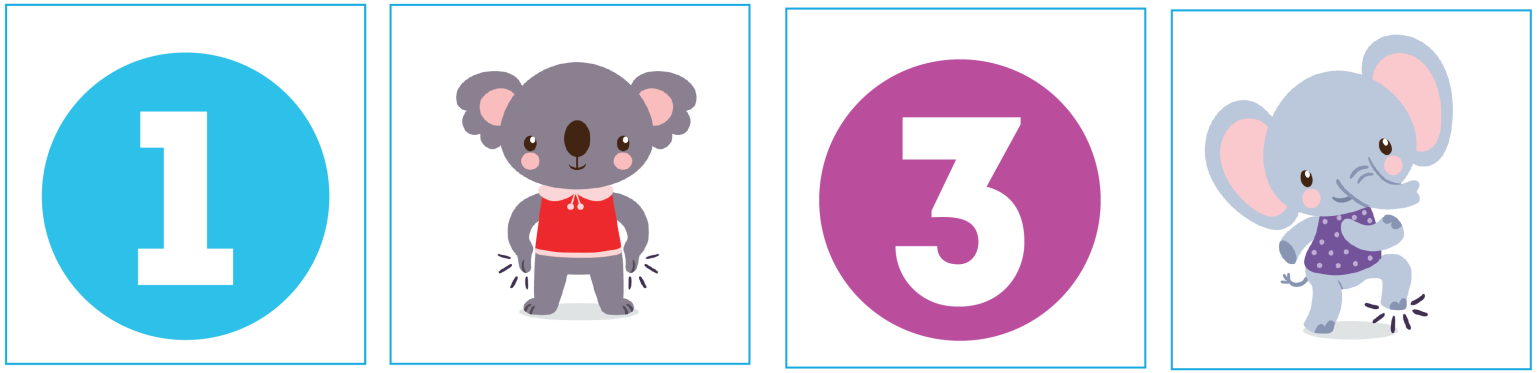
# Let's Clap Pat

| | | | |
|---|---|---|---|
| 1 | 2 | 3 |  |
| 1 | 2 | 3 |  |

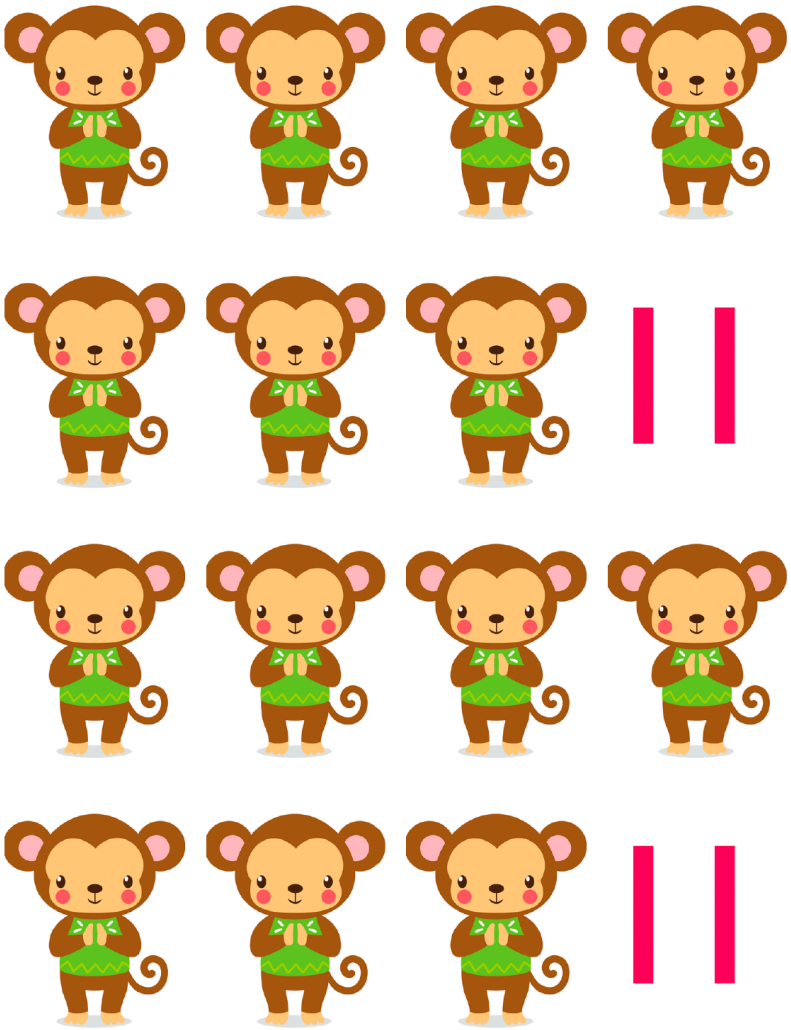
# Let's Stomp Right, Left

| | | | |
|---|---|---|---|
| 1 | 2 | 3 |  |
| 1 | 2 | 3 |  |

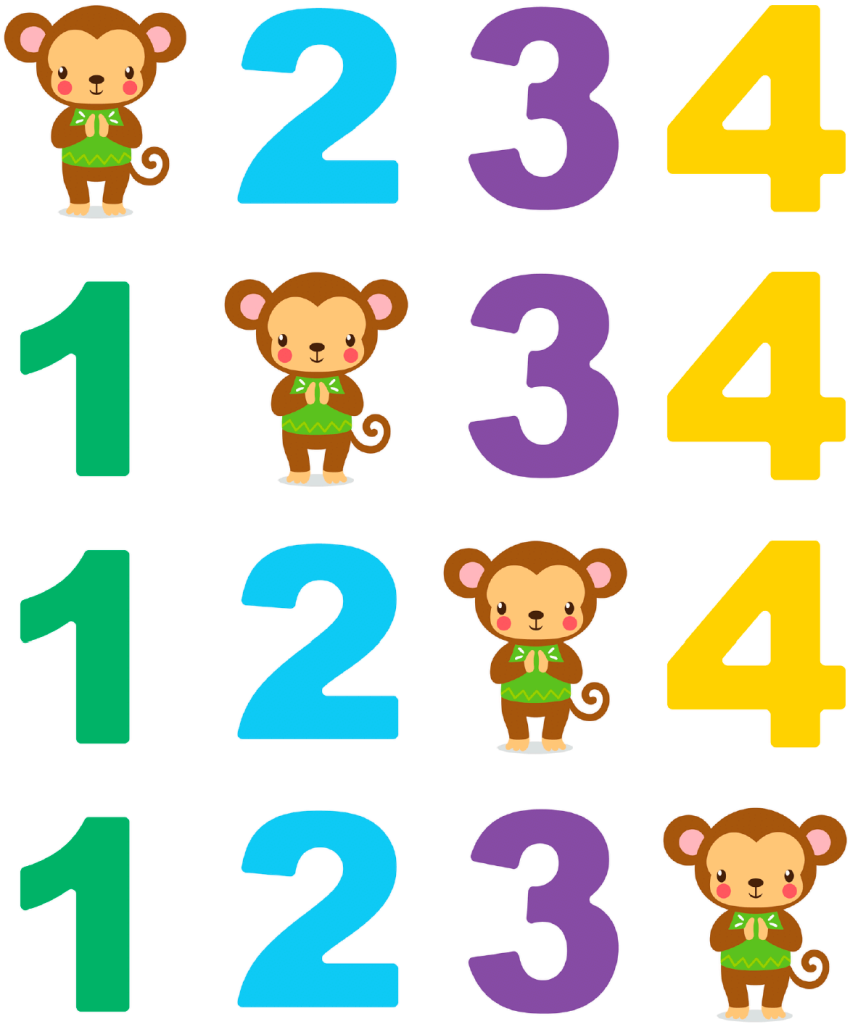
# Let's Pat & Stomp



# Let's Pause



# Traveling Beats



# RESEARCH

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.