STRENGTHENING EXECUTIVE FUNCTION IN THE EARLY YEARS:

DESIGNING ENVIRONMENTAL SCAFFOLDS AND CHILD-SPECIFIC INTERVENTIONS

WEBINAR 1

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AbleNet University Webinar	**July 24, 2018**

Executive Functioning Webinar Series: Objectives

- Increase awareness and understanding of executive functioning (EF) development in young children
- Learn how to build and practice EFs during daily routines and structured activities in young children who have or at risk for developmental delays.
  - Gain skills in creating growth-promoting environments and personalized instructional interventions to nurture EFs in children
  - Increase access, engagement and participation of young children using UDL principles to minimize barriers and reach diverse learners
  - Learn how to craft easy-to-use learner-specific scaffolds and adaptations

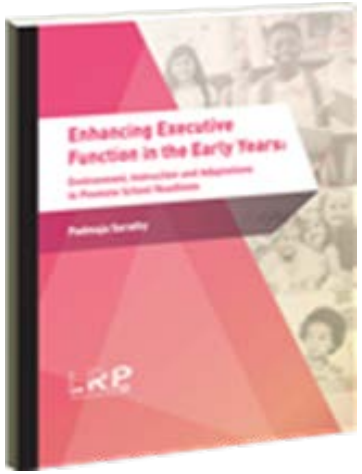
THE THREE-PART WEBINAR SERIES TO STRENGTHEN THE THREE COMPONENTS OF EXECUTIVE FUNCTION

- **Webinar 1will Focus on Building Working Memory**
- **Webinar 2 will Concentrate on how to Foster Inhibitory Control**
- **Webinar 3 will Feature on how to Cultivate Cognitive Flexibility**

- **You will Learn about:**
  - **EF and the associated components**
  - **Why focus on EF development in the early years?**
  - **Environment, Instruction and Personalized Adaptations with Depiction of student-specific scenarios to build Working Memory (WM) during daily routines**
  - **Tools and resources you can use to strengthen working memory**
  - **Integrating child-focused best-practices: UDL principles and DEC recommended practices**

A Major Resource

Enhancing Executive Function in the Early Years: Environment, Instruction and Adaptations for School Readiness

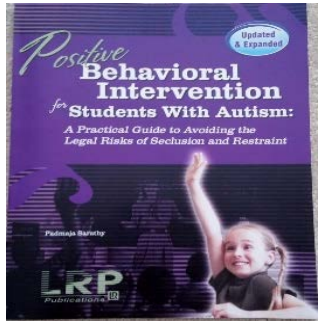


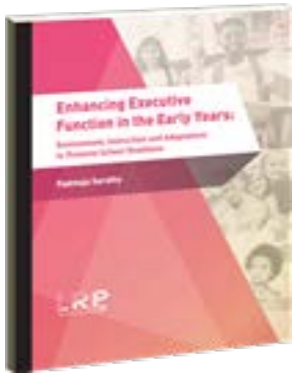
Sarathy, P. (2017). Horsham, PA: LRP Publications

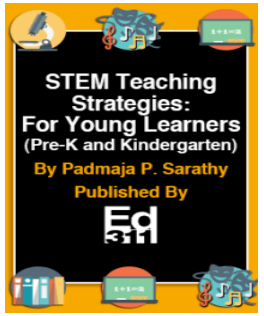
Get a strong foundation of knowledge about executive functioning and corresponding deficits, plus ready-to-use strategies and tools to deliver fun, meaningful and engaging instruction that advances young children's skills — all easily integrated into typical routines and activities of preschool and kindergarten settings:

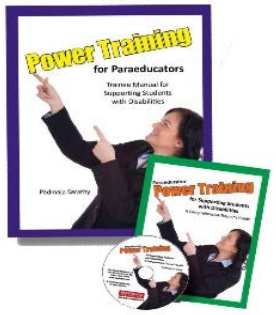
- ✓ Strategies to encourage pretend play with easy-to-use scaffolds and adaptations to nurture cognitive flexibility, creativity and self-control
- ✓ Descriptions on how to use games, songs and movement activities to continually increase the challenge to strengthen executive functioning skills
- ✓ Techniques to teach children how to use calming methods to develop self-control and reduce behavioral challenges
- ✓ Child-specific scenarios depicting a diversity of executive functioning difficulties with personalized interventions
- ✓ And more!

Sarathy's Publications: Books and Quick Reference Guides



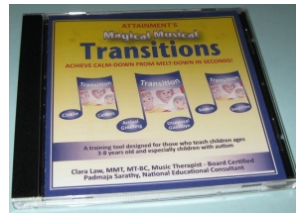


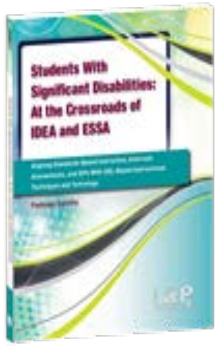


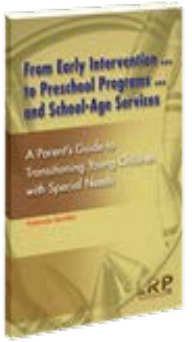


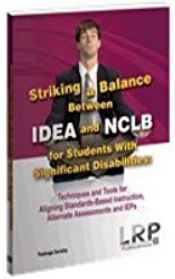
Focus Areas

- **Autism: Behavior Interventions, Support Strategies, Music CD - Transitions**
- **Early Childhood: Transition, Parent Guide and STEM Teaching Strategies**
- **Executive Function**
- **Paraeducator Training Guide and DVD**
- **Severe and Multiple Disabilities**
- **Significant Disabilities and ESSA**









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Executive Functioning – An Overview

- Executive functioning skills are the foundational building blocks for the early development of both cognitive and social capacities.
  - **Children need EFs — able to focus, hold, and work with information in mind, filter distractions, switch gears and exercise self-control — for school readiness and academic success**
- EFs support **the process**, **the how of learning**— focusing, remembering, planning—that enables children to effectively and efficiently master **the content, the what of learning** —reading, writing, computation.
- Executive Functioning help children as they learn to read and write, remember the steps in performing an arithmetic problem, take part in group activities, and enter into and sustain play with other children.

The Critical Early Years

- **Executive Functioning skills are not skills that children are born with but develop over time, shaped by experiences.**
- **The brain grows at a rapid pace in the early years.**
  - A child's brain develops at the fastest rate and in the most extraordinary ways in the first 2000 days.
  - Neural connections, called synapses, develop very rapidly at a rate of 1million synapses per second (Center on the Developing Child, Harvard University, developingchild.harvard.edu/)

- **Brain's plasticity or the ability to recognize and adapt is greatest during the early years.**
- **"Brain architecture is established early in life and supports lifelong learning, behavior, and health."**

The Components of Executive Functioning

- **EF is broadly categorized into three 3 major cognitive processes:**
  - **Working Memory** (ability to hold information and use it)
  - **Self Control/Inhibitory Control** (the ability to master thoughts and impulses and to pause and think before acting)
  - **Cognitive or Mental Flexibility** (the capacity to shift gears and adjust to changing demands) (Miyake et al., 2000)
- **Each type of Executive Function skill draws on the elements of the other.**

❖ The statistics unit of the Department of Education has added measures for collecting data on executive functioning (EFs) of young children using the same three aspects of EFs as noted above.

How Do Children Manifest Executive Functioning?

Workig memory - typical examples:

- Follow teacher instructions to complete the task.
- Recall relevant information to respond to questions.
- Stay focused and pay attention during group instruction.

Inhibitory control - typical examples:

- Wait and not blurt out the answer
- React without agitation: resolve conflicts harmoniously during play and accept losing in the game calmly; request permission before taking another child's item

Cognitive flexibility - typical examples:

- Apply different rules in different settings
- Able to shift gears and adapt to different environments, activities and personnel

(Center on the Developing Child, Harvard University, 2011)

Early Focus on Executive Functioning (EFs): The Benefits

- **EFs are essential for academic success and also crucial for success beyond school, for better life outcomes.** (Diamond, 2012; Moffitt, et al., 2011)
- **Early intervention reduces the impact of poverty. EF deficits,** relative to other cognitive skills, **show up in kindergarten children who are at-risk because of economic disadvantages.** (Diamond et al. 2007)
- **EFs is amenable to remediation.** (Anderson & Reidy, 2012)
- **Children who most need improvement in EFs benefit the most.** (Diamond, 2012)
- **Executive Function may be delayed or compromised in some children and therefore, need to be addressed early.** (Anderson & Reidy, 2012; Schoemaker and colleagues, 2011)

What Recent Research Tells Us: EF and the Early Years

- **Researchers found EF deficits in kindergarten predict multi-year academic difficulties in a study involving students from K thru 3rd gr.** (U.S. Department of Education's Early Childhood Longitudinal Study; Morgan et al., 2018)
  - Impact on children's academic achievement trajectories from first to third grade.
    - Skills that help children focus, control their impulses, remember details, and other skills essential in the classroom. (Morgan et al., 2018)
  - "Had odds of experiencing repeated academic difficulties that were about 10 times greater than children without working memory deficits" (Morgan et al., 2018).
- **Working memory problems seemed to be the most worrisome.**
  - **Early intervention efforts to address working memory problems is likely to be the most fruitful option.** (Morgan et al., 2018)
- "We saw a bit of an improvement in EF skills after a focused intervention program (REDI) ended at the end of preschool, but the bigger effects emerged over time in the children that started out with lower EF" says Bierman (2017).

Working Memory Difficulties: What Do They Look Like?

Young Children may exhibit problems with…

Being able to attend, focus on a task and complete it with minimal support

Responding to questions requiring recall of previously learned information

Processing complex information/concepts and may frequently require reteaching

Following directions involving multiple steps

Remembering to follow daily routines and practices

Planning and prioritizing

EF Difficulties in Children with Special Needs

- Students with intellectual disabilities may have difficulty recalling information and applying it to complete a task.
- Students with the diagnosis of ADHD, Autism Spectrum Disorders (ASD) Autism Spectrum Disorders (ASD) and Emotional Disturbance may experience problems with exercising self-control and mental flexibility (shifting gears). (Anderson & Reidy, 2012; Schoemaker and colleagues, 2011)
- Students with Autism Spectrum Disorders (ASD) have executive function differences, impaired cognitive flexibility and self-regulation difficulties (Aspy, 2012).
  - Adjusting to changes in strategies, shifting focus from one task to another, transitioning to different environments and personnel, changes in routine, etc. is challenging for them.

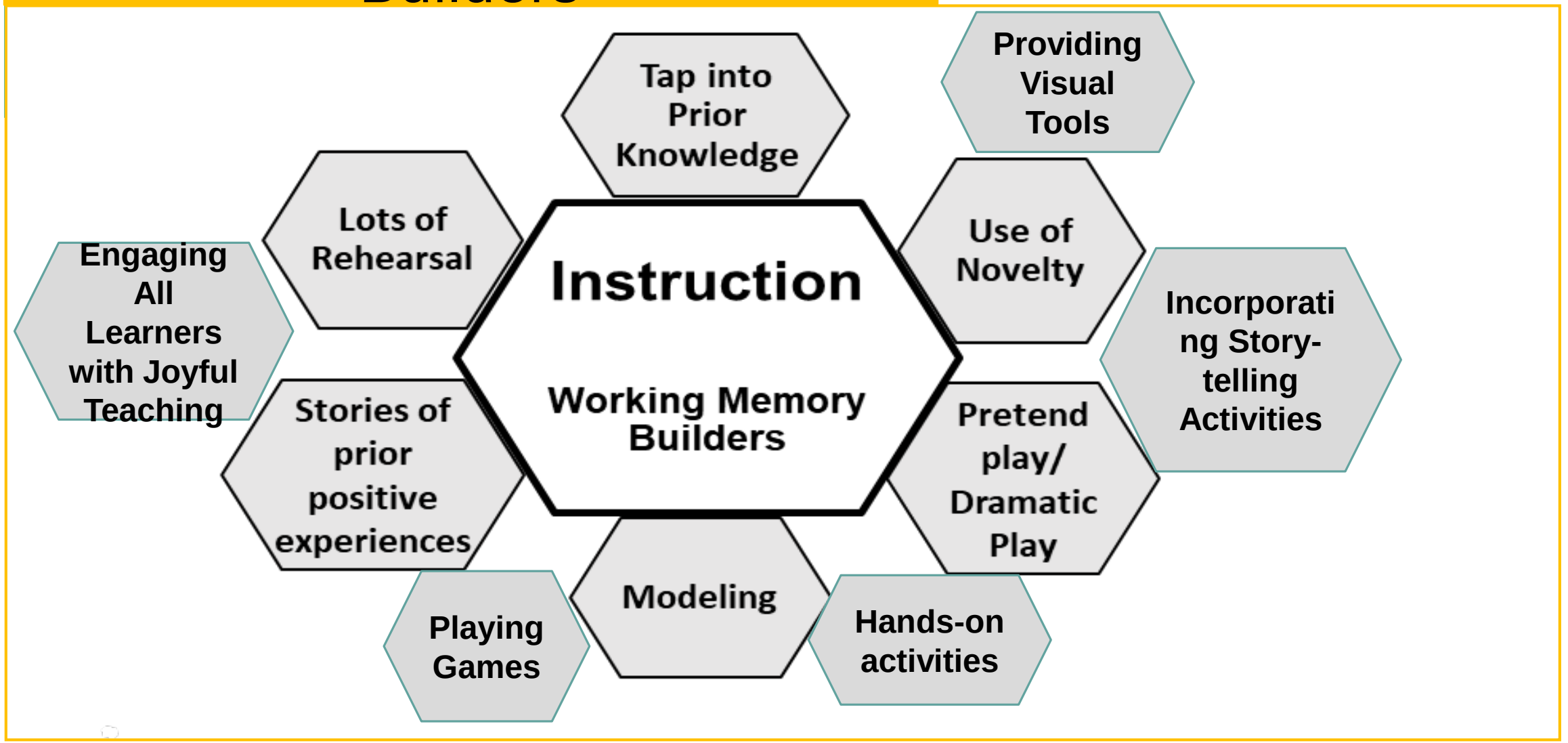
Working Memory – A Nurturing Environment

- Consider each child's strengths, needs and preferences at the initial planning stage of the instructional process.
- Increase knowledge and understanding of the developmental stages of children and the associated characteristics and expectations.
- Ensure application of UDL in into your design of the environment and delivery of instruction to foster EFs to promote Access, Action and Expression and Engagement of learners with diverse needs:
  - **1. Provide multiple, flexible methods of presentation; 2. Provide multiple, flexible methods of action and expression. 3. Provide multiple, flexible options for engagement.** (http://www.udlcenter.org/)
- Get familiar with the DEC Recommended Practices (www.dec-sped.org/recommendedpractices). Incorporate them into designing your environment and the planning and delivery of instruction.

Environmental and Instructional Nurturers for growing Working Memory: What Supports Do You Currently Have in Place?

- ❑ Routine use of visual tools (A Word Wall and Number Wall paired with pictures and/or objects, story-map organizers, etc.)
- ❑ Always begin instructional lessons with tapping into prior knowledge
- ❑ Incorporate novelty items routinely as part of the instructional session
- ❑ Recruit high levels of learner engagement with lots of hands-on activities
- ❑ Regularly use storytelling strategies
- ❑ Multiple opportunities for rehearsal with diverse multi-sensory materials

Working Memory Instructional Builders



Working Memory Builders

- Make learning joyful and motivating for children to increase their focus and sustain attention.
- Connect with past learning experiences that were joyful.
- Activate student's prior knowledge to connect new information with old.
- Incorporate novel materials to seize and sustain attention.
- Make the instructional activity an interactive learning experience incorporating multi-sensory elements. Imagine your students are requesting —Tell Me, Show Me, Model for Me, Watch Me Deliver, and Give Me Feedback.
- Offer multiple rehearsals.
- Ensure that the instructional activities are culturally responsive.

- Teach story elements aided with a story map organizer tool to connect abstract concepts with a visual presentation tool.
  - Attach photos or representational concrete items to aid children's comprehension of the story elements and to facilitate making connections and later recall.
- Involve children in story telling activities.
- Providing memory aids, word walls (paired with visuals

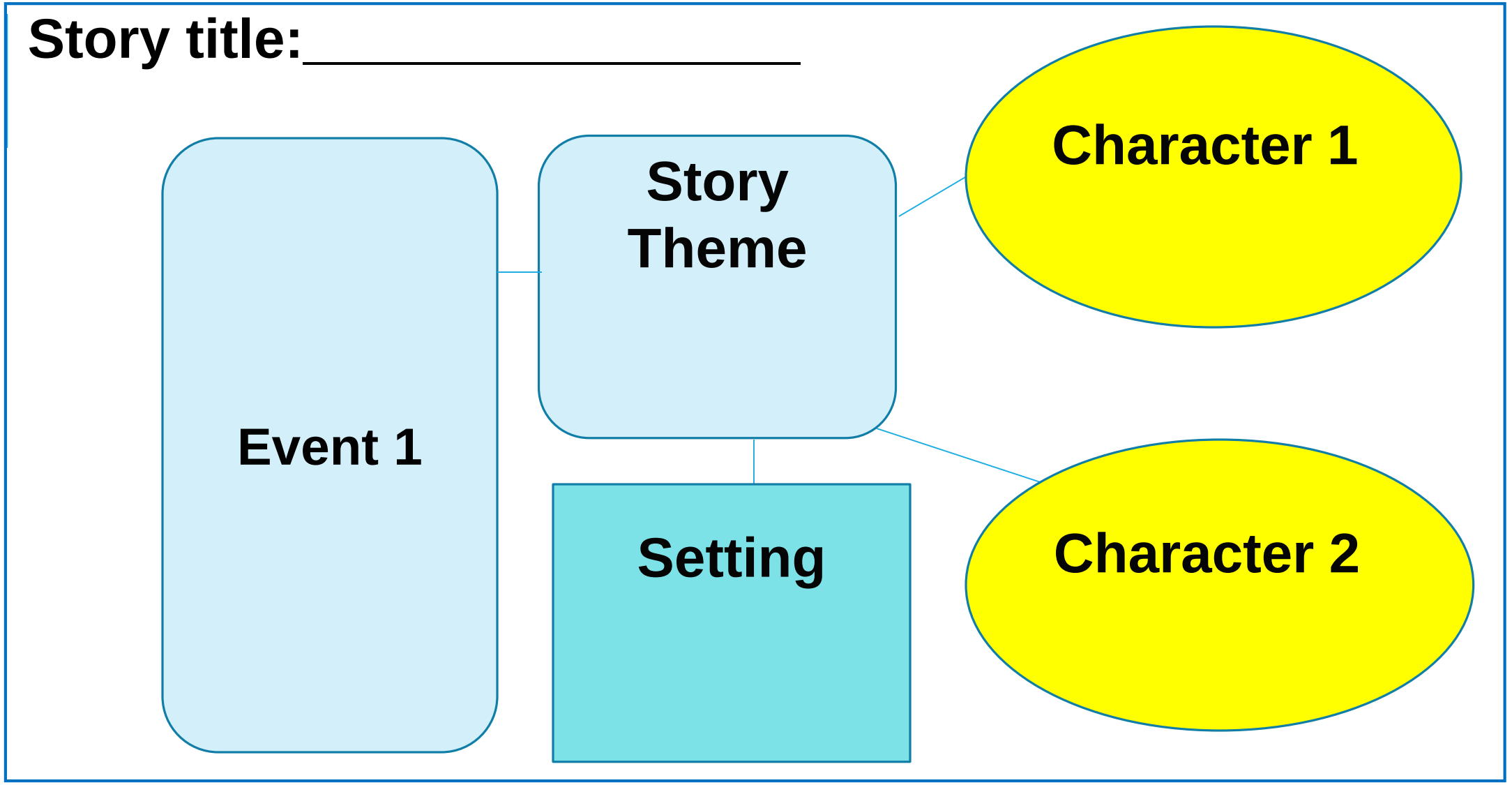
Word Wall (paired with photos)

red	blue	yellow	**green**
bird	sky	banana	leaf

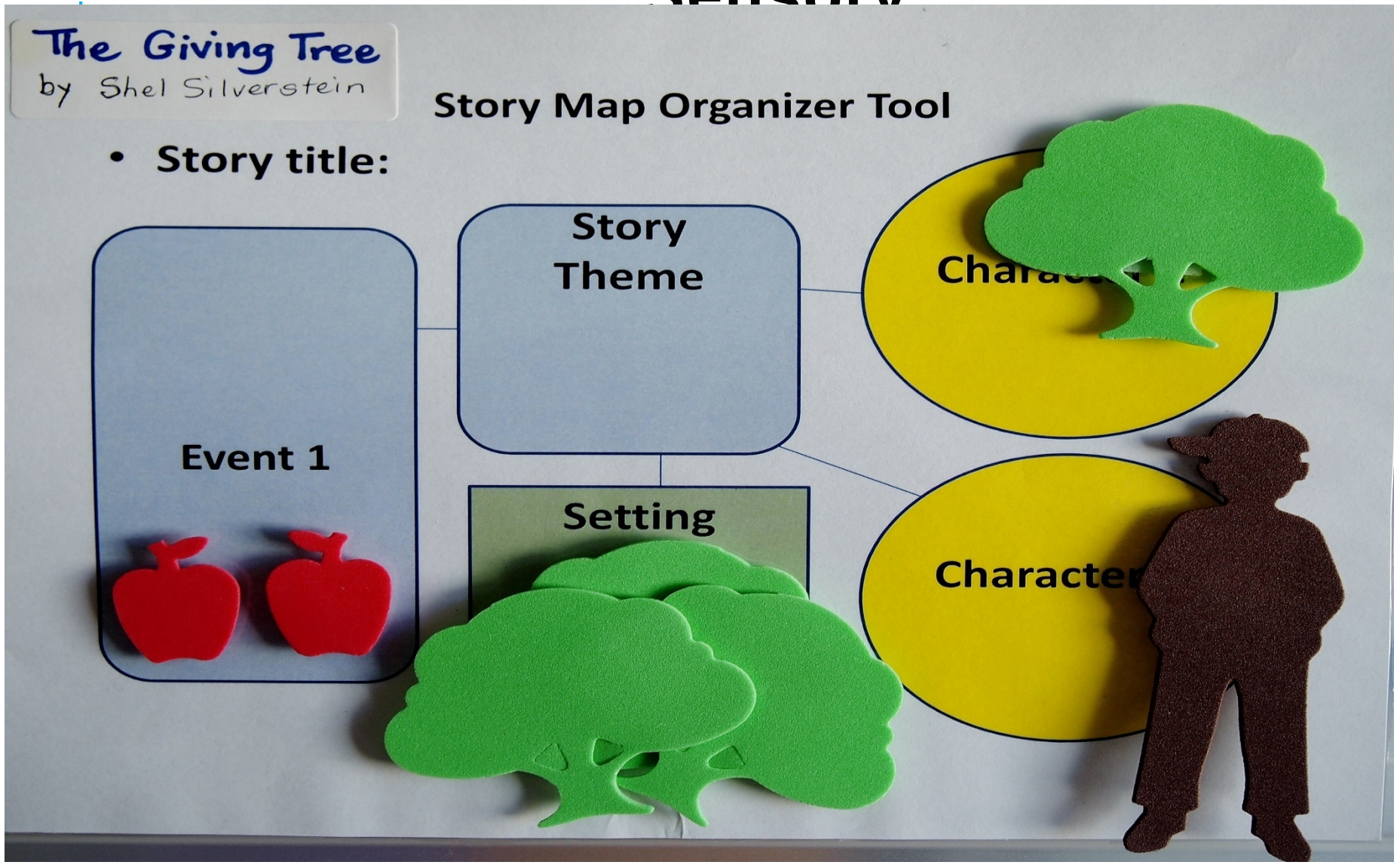
Though t bubble

Story Map Organizer

Story title:_____



Story Concept Enhanced with Multi-Sensory



Add concrete props and/or visuals or sensory items to story map graphic organizer to facilitate comprehension and for later recall.

Building Working Memory

- Combine verbal presentation with visual elements to assist with remembering and for easier recall.
- Incorporate multi-sensory elements - interactive demonstrations, story-telling, role play and drama to engage learners
- Provide visual tools – graphic organizers, concept maps, Venn Diagrams, etc. as to stimulate memory about the pertinent topic.
- Engage students in a hands-on activity immediately following direct instruction.
- Play games exercises working memory - increases motivation for learning and rehearse what they have learned.
  - Mental math games, recalling and repeating a number or a word pattern, recalling a sequence in order, etc.
  - Vocabulary games, card games and board games

Sharing, Telling and Dramatizing Stories

Build Attention, Focus, and Recall with Motivating Learners

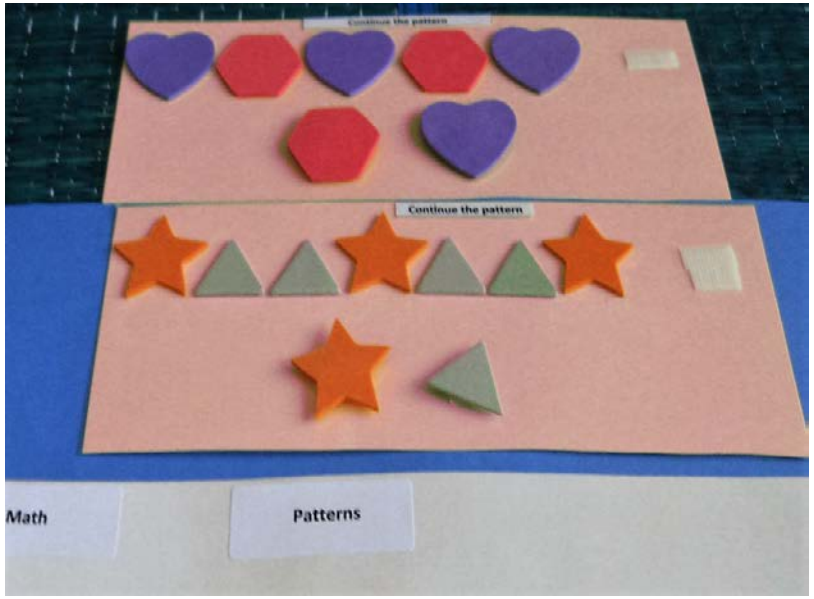
- Present animated story-reading and story-sharing
  - Share books with repetitive text. Combine with choral reading
  - Incorporate props and masks to enhance story-reading
- Involve children in group story-telling with teacher modeling, and children taking turns to build the story
- Enhance stories with role play and drama to increase motivation, literacy skills, and learn to take turns.
- Infuse music, and movement activities routinely.

Learner Scenario - Adaptations

Adrian (a kindergartner) forgets easily. He experiences difficulty with recalling information to answer questions and struggles to retain information/concepts even for a few seconds during calendar activities, story-time, math lesson, etc.

What are some support steps to help the learner?

- ✓ Teach concepts enhanced with multi-sensory elements and concrete props.
- ✓ Provide verbal cues and visual aids to increase success.
- ✓ Help learner to connect with prior knowledge.
- ✓ Provide additional wait-time to respond; Support with verbal and visual cues.
- ✓ Ensure multiple rehearsals to facilitate retention and transfer to working memory.
- ✓ Offer “invisible support”.
- ✓ Monitor prompts given. Gradually, fade the cues and prompts.
- ✓ Provide encouraging feedback.



Adapted Tools

Increase Access and Response with Visuals and Multi-sensory items.

A Graduated Number Line

Attach it to desk for student to gain visual understanding of abstract concept and make a response.

Fasten with concrete items if needed for tactile input, gain concept knowledge and make a response.

Adapted from Sarathy, 2014

Adapted Calendar

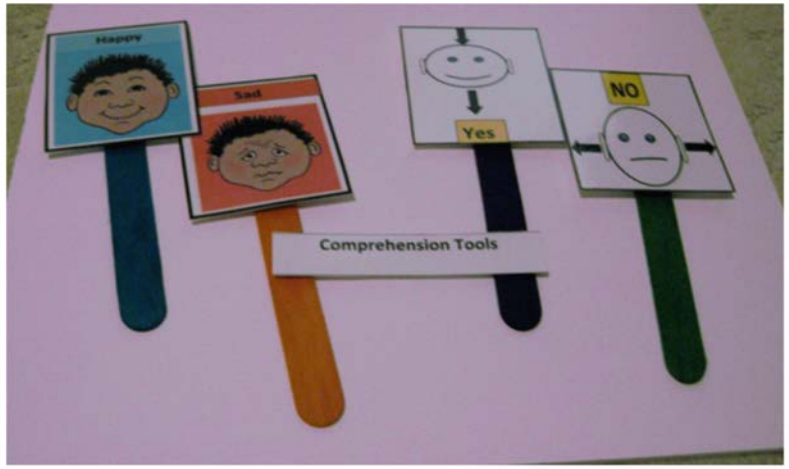
Learner Scenario - 2

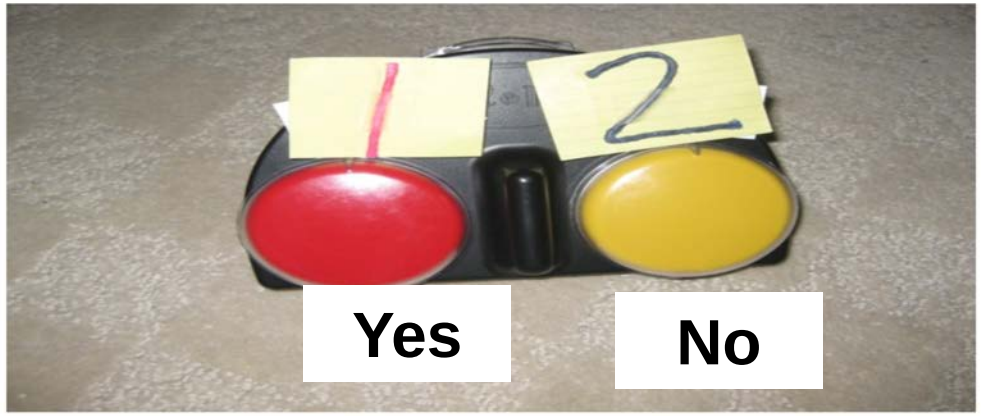
- *Simone has cerebral palsy and her communication and motor difficulties present some challenges to her active participation. Friendly by nature, she smiles a lot. She does not speak and uses a few gestures to communicate.*
- *She has limited attention span, gets distracted and experiences difficulty with recall.*

A few of the techniques and tools that will help Simone:

- ✓ Use of **real concrete items** to represent concepts.
- ✓ Use of **systematic instruction with prompt fading** procedures.
- ✓ Presenting **limited text and information** at a given time.
- ✓ Multiple **opportunities for rehearsal.**
- ✓ Lots of **hands-on activities**, **adapted books** fastened with picture/object, a choice board with pictures/concrete items to respond.
- ✓ **Use of AT** for communication and engagement.

Adapted Tools
Response Participation Tools





Increase communication and response with Visuals and Multi-sensory items.

Adapted from Sarathy, 2014

Children's Books Suggestions Strengthening WM

To Help with Making connections, Recalling, Problem-solving and Critical thinking, etc.

If You Give Mouse A Cookie by Laura Numeroff

Brown Bear, Bear, Brown Bear, What Do You See? by Eric Carle

Caps for Sale by Esphyr Slobodkina

The Very Hungry Caterpillar by Eric Carle

Seven Blind Mice by Ed Young

The Doorbell Rang by Pat Hutchins

Strengthen Executive Function: Working Memory

- ✓ENSURE HIGH LEVELS OF LEARNER ENGAGEMENT
- ✓Build on Prior Knowledge
- ✓PRACTICE WITH HANDS-ON ACTIVITIES
- ✓Use Novelty to Increase Motivation and to Inspire Curiosity
- ✓Incorporate Multi-sensory materials routinely
- ✓Offer Multiple Opportunities for Rehearsal
- ✓**Build a Growth Mind-Set**
- ✓Provide Encouraging and Task-Specific Feedback

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Web Resources:

- Autism Internet Modules: Columbus, OH: OCALI. www.autisminternetmodules.org.
- Center on the Social Emotional Foundations For Early Learning: http://www.vanderbilt.edu/csefel/
- National Center on Universal Design for Learning: http://www.udlcenter.org
- Super Brain Yoga www.superbrainyoga.org.

T H A N K S.

A SPECIAL THANKS TO ABLENET UNIVERSITY FOR HOSTING THE WEBINAR

The Next webinar in the Executive Function series

–Inhibitory Control–

August 7th, 2018 from 11 AM-12 noon (CDT)

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