How Does Project Work with Children Grow the Brain?

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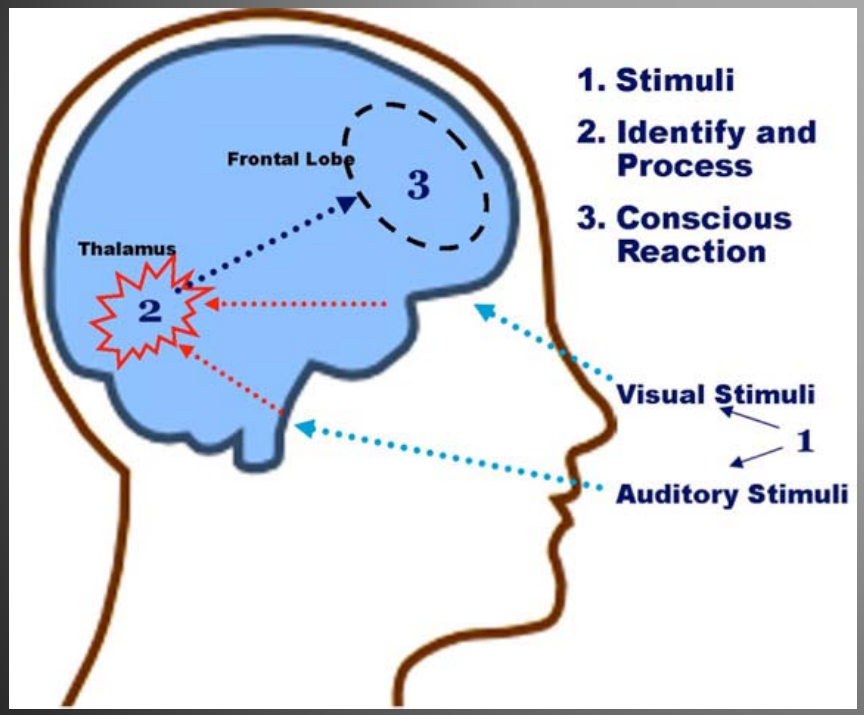
Key Ideas

- Brain Science as informant for ECE teachers
- Importance of executive functioning to later success in school & life
- Self-regulation as priority for ECE
- Project work as vehicle for developing executive functioning
- SC Early Learning Standards (AL & SE) focus on EF skills

Note: This presentation will primarily focus on supplemental visual documentation from several long-term projects that is not included in this handout.

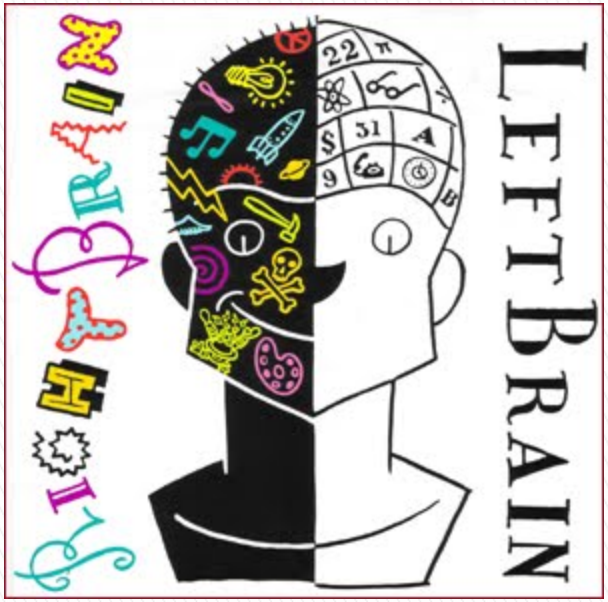
Brain Development



- Brain builds neurons & connections as it processes stimuli
- 100 billion neurons by age five – EC period is massively important!!!
- Use it or lose it! (neurons can die from disuse)
- Stronger connections = better memory
- Frontal lobe is where higher order thinking develops

Brain Development

- The brain is uniquely organized per individual
- Continually growing & adapting – intelligence not fixed
- "Brain compatible" classrooms make learning a positive emotional experience
- Active, meaningful learning promotes brain development



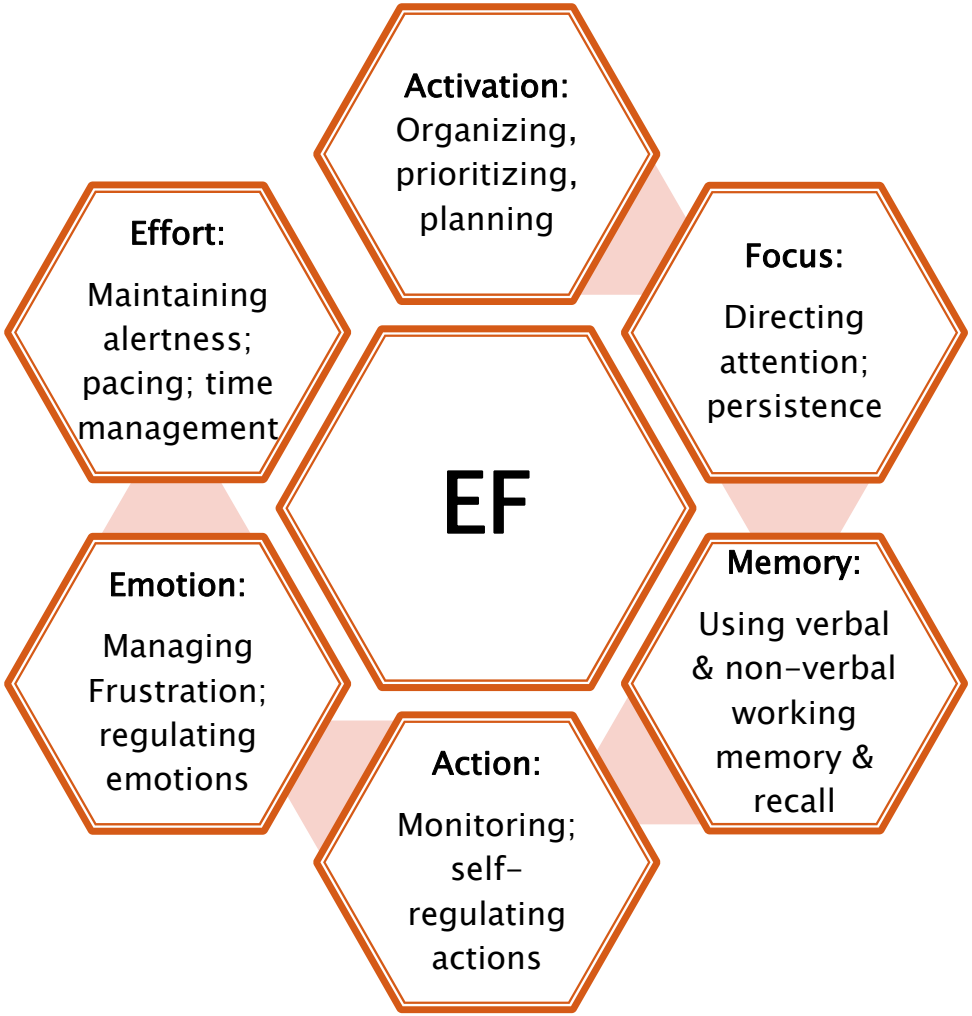
4 Key Principles (Rushton, 2011)

Hemispheric dominance not the big issue

Executive Functioning

- Frontal lobe is the "command center"
- EF is set of mental processes that allow the brain to work effectively to solve problems
- Connect past experience with present actions
- Better predictor of school success than IQ (Berk, 2001)

Executive Functioning Key Components (Brown, 2005)



Self-regulation is ECE priority

- "Self-regulation predicts effective development in virtually every domain" (Laura Berk, 2001)

Project Work

- Long-term project work requires all the elements of EF
- Long-term projects provide a context that supports the principles of brain development

Elements of Project Work vs. Thematic Units/direct instruction

Long-term Projects	Thematic Units
Adult anticipated	Adult generated
Child directed	Teacher directed
Small groups	Whole class
Driven by exploration	Teacher planned
Time varies	Set time frame
Multi-dimensional	One theme at a time
Document process	Document ending
Constructed knowledge	Transmitted knowledge

Project Examples & EF Elements

EF Element	Project	EF Dimensions & Characteristics Focus
Activation	*Pennies for Peace*	Organizing; prioritizing; strategizing
Focus	*24 foot Python*	Getting it perfect, persistence
Effort	*Owls/birds*	Pacing, waiting; sustaining interest
Emotion	*Fancy Dress Project*	Coordinating many personalities; regulating emotions
Memory	*Water Project*	Accessing conceptual recall
Action	*Park Project*	Monitoring & self-regulating behavior

Activation: Pennies for Peace (organizing)

Focus: 24 foot Python (getting it perfect, persistence)

Effort: Owls/birds (pacing, waiting)

Emotion: Fancy Dress Project (coordinating many personalities)

Memory: Water Project (conceptual recall) & Dinosaur Project (movie)

Action: Park Project (self-regulation)

Climbing the trees

SC ELS Prioritize Dimensions of Executive Functioning

Approaches to Learning:

- AL 1. Children engage in play as a means to develop their individual approaches to learning.
- AL 2. Children show curiosity, eagerness and satisfaction as a learner.
- AL 3. Children demonstrate initiative, engagement, and persistence in learning.
- AL 4. Children demonstrate an increasing ability to envision a goal and to accomplish it.
- AL 5. Children extend their learning through the use of memory, reasoning, and problem-solving skills.

Social/Emotional Development:

- SE1. Children will demonstrate a positive sense of self.
- SE2. Children will demonstrate self control, respect and responsibility.
- SE3. Children express feelings and show concern for others.
- SE4. Children will form healthy social relationships.

Core Standards & EF

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Mathematical Practices: (Grade 3 outcomes)

- Demonstrate independence.
- Build strong content knowledge.
- Respond to the varying demands of audience, task, purpose, and discipline.
- Comprehend as well as critique
- Value evidence
- Use technology and digital media strategically and capably
- Understand other perspectives and cultures

Language Arts: characteristics of graduates who have met Core Stds

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