



## MEASURE WHAT MATTERS!

### Agency Development, Literacy, & Numeracy

*The Science of Early Learning* summarizes current cognitive developmental research on agency, literacy, and numeracy in young children, birth through age eight. The report was developed by Deans for Impact in collaboration with Dylan Kane and Callie Lowenstein, practicing teachers; Rachel Robertson of Bright Horizons; Dr. Daniel Ansari of Western University; Dr. Stephanie Carlson of the University of Minnesota and Reflection Sciences, Inc.; and Dr. Anne Castles of Macquarie University.

#### **Agency Development**

The primary domain of the report emphasizes the importance of agency development in answering questions about how children:

1. Develop a sense of self
2. Begin to respect others
3. Self-regulate their behaviors
4. Develop independence

The main principles of learning science addressed in this section include: sensitive and emotionally-responsive caregiving, secure attachments, development of a secure sense of self, emotion recognition and regulation, empathy, perspective-taking, development of executive function skills, and independence (autonomy) development.

*Try at Home:* When children engage in pretend and imaginary play, they are practicing key executive function skills, such as considering another character's abilities and emotions, taking steps back in order to think about dilemmas from a different or broader perspective, reflecting on choices in how to respond to situations, and social problem-solving. Supporting imagination at home can provide children with the opportunity to practice skills they can use in future real-world scenarios.

#### **Literacy Development**

In this section, writers focus on the skills needed for reading and writing. Questions addressed include, how young children:

1. Learn the meaning of their ABC's
2. Become fluent readers
3. Begin to understand what they read
4. Express their ideas and thoughts in writing

This section of the report concentrates on several principles of learning science: developing phonemic and morphological awareness, understanding how spoken sounds link to individual letters, spelling, word recognition, developing vocabulary and conceptual understanding of story and text structures, handwriting or transcription fluency, and storytelling.

*Try at Home:* As children develop a more advanced understanding of letters, sounds, and words, use story time to start introducing connections between words and images. While reading aloud, point to the text, word-by-word, and encourage children to help you read by recognizing words that are repeated throughout the story.

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## Numeracy Development

Learning numbers and developing an understanding of numerical concepts and constructs is an important skill for young children as they enter their school years. This section of the report explores questions about how young children:

1. Learn to count
2. Develop abstract knowledge of mathematical concepts
3. Learn properties and manipulation of numbers
4. Effectively learn mathematics in different environments

There are several principles of learning science that are centered on mathematics, including: reciting the count sequence (1, 2, 3...), the cardinality principle, numerical symbols, abstract mathematical concepts (addition, subtraction, multiplication, etc.), number lines, math anxiety, and more.

**Try at Home:** Parents can explicitly show their child different representations of the same number: for instance, the Arabic numeral 3; the word "three"; a set of three identical objects; and a set of three different but related objects, such as three different pieces of fruit. Linking these representations helps children to apply them in new contexts in the

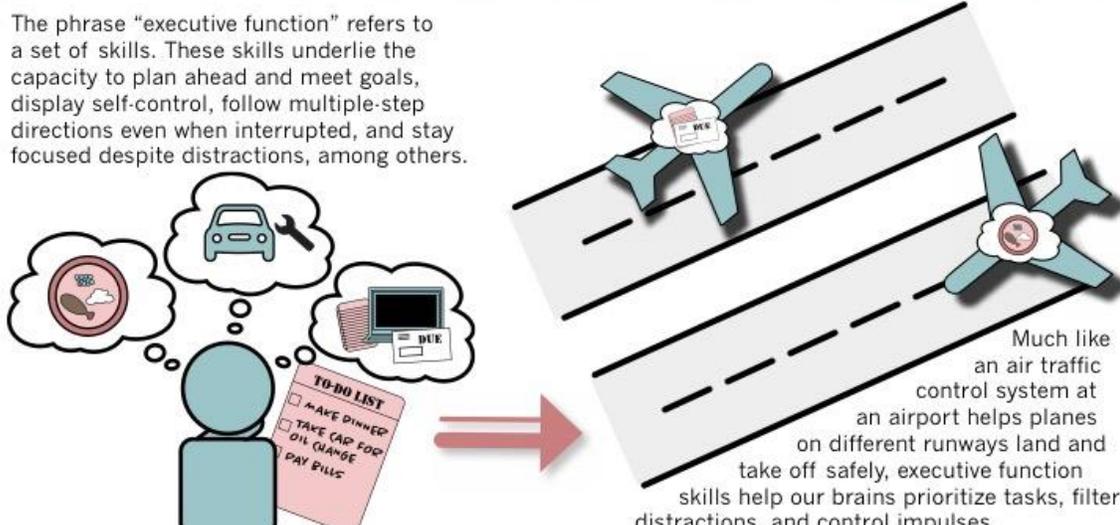
## Agency Development, Literacy, & Numeracy in Young Children

When it comes to early development and learning, existing research stresses the importance of numeracy, literacy, and agency development in early childhood. *The Science of Early Learning* report covers these domains in order to best understand learning. Writers of this report hope that it can be used as a launching pad from which parents, caregivers, educators, etc. can better comprehend, approach, tackle, and connect principles of learning science to practical solutions both in and out of the classroom setting.

# WHAT IS EXECUTIVE FUNCTION?

## AND HOW DOES IT RELATE TO CHILD DEVELOPMENT?

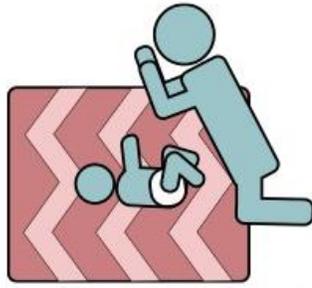
The phrase "executive function" refers to a set of skills. These skills underlie the capacity to plan ahead and meet goals, display self-control, follow multiple-step directions even when interrupted, and stay focused despite distractions, among others.



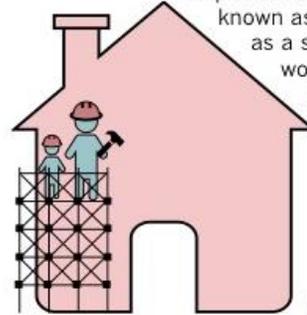
Much like an air traffic control system at an airport helps planes on different runways land and take off safely, executive function skills help our brains prioritize tasks, filter distractions, and control impulses.

## NO ONE IS BORN WITH EXECUTIVE FUNCTION SKILLS, BUT NEARLY EVERYONE CAN LEARN THEM.

Our genes provide the blueprint for learning these skills, but they develop through experiences and practice. The foundation is laid in infancy, when babies first learn to pay attention. Relationships with responsive caregivers are particularly important at this stage. Something as simple as playing a game of peekaboo can help build the early foundations of working memory and self-control as a baby anticipates the surprise.



Adults set up the framework for children to learn and practice these skills over time by establishing routines, breaking big tasks into smaller chunks, and encouraging games that promote imagination, role-playing, following rules, and controlling impulses. These techniques are known as "scaffolding."

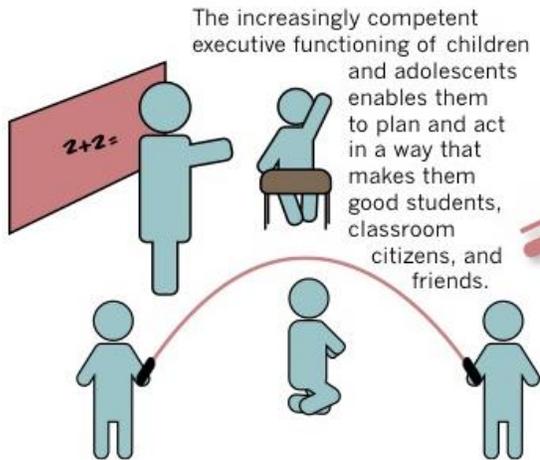


Just as a scaffold supports workers while a building is being constructed, adults can use these activities to support the emergence of children's executive function skills until they can perform them on their own.

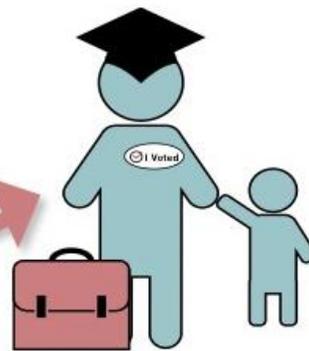


These skills typically develop most rapidly between ages 3-5, followed by another spike in development during the adolescent and early adult years. It takes a long time and a lot of practice to develop them, but, as children's executive function skills grow, adults can gradually allow children to manage more and more aspects of their environment.

## BUILDING CHILDREN'S EXECUTIVE FUNCTION SKILLS BENEFITS EVERYONE.



The increasingly competent executive functioning of children and adolescents enables them to plan and act in a way that makes them good students, classroom citizens, and friends.



In turn, this helps them grow into adults capable of juggling a multitude of commitments, such as parenting, employment, continuing education, and civic involvement. Even health is affected, as strong executive function helps people stick to healthy habits and reduce stress. The more a society invests in building the executive functioning of its children, the greater dividends it will see in the future.

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For more information: <https://developingchild.harvard.edu/ef>