

Cognitive Development for Infants and Toddlers

Created by the Arizona Department of Education
Early Childhood Education Unit

Agenda

- Introductions
- Explore the components of Cognitive Development with a focus on preparing for school-readiness
- Identify the role of the caregiver/teacher
- Demonstrate the interconnectedness of the domains
- Wrap-up and review

Learning Objectives

- Explore effective strategies to support cognitive development of infants and toddlers.
- Identify the connection of cognitive development to other domain of learning, especially Approaches to Learning.
- Learn about developmentally appropriate practices for infants and toddlers.
- Understand the interconnectedness of the Infant/Toddler Developmental Guidelines and the Arizona Early learning Standards and links to school readiness.

Diaper Bag

Reflection!



4

Early Experiences Matter:

- The infant's brain is literally waiting for experiences to determine how connections are made (Johnson2005).
- Before birth, it appears that genes mainly directed how the brain establishes basic wiring patterns.
- After birth, environmental experiences guide the brain's development.
- The inflowing stream of sights, sounds, smells, touches, language, and eye contact help shape the brain's neural connections (Johnson, 2007).
- Depressed brain activity has been found in children who grow up in a deprived environment (Nelson, Jeanah, & Fox,2007).
- Infants whose caregivers expose them to a variety of stimulation—talking, touching, playing—are most likely to develop to their full potential.

2014 Physical and Cognitive Development in Infancy (Santrock_Ch3.pdf)

At Birth	Three Months	Fifteen Months
		

Drawings of neural connections in the human brain.

Infant cognitive development is the study of how psychological processes involved in thinking and knowing **develop** in young children.

Information is acquired in a number of ways including through sight, sound, touch, taste, smell and language, all of which require processing by our **cognitive** system.

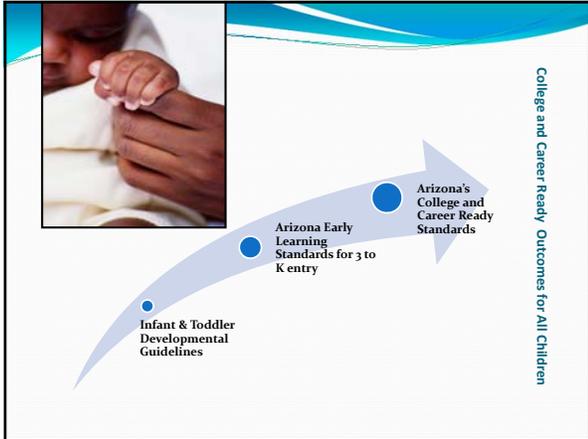
"It is with children that we have the best chance of studying the development of logical knowledge, mathematical knowledge, physical knowledge, and so forth."



Jean Piaget

CONNECTING TO SCHOOL READINESS





Providing a framework...

<u>ITDG</u>	<u>AZELS</u>
<ul style="list-style-type: none"> • Social and Emotional Development • Approaches to Learning • Language Development and Communication • Cognitive Development • Physical and Motor Development 	<ul style="list-style-type: none"> • Social and Emotional Development • Approaches to Learning • Language and Literacy • Mathematics • Science • Social Studies • Physical Development, Health and Safety • Fine Arts

11

Approaches to Learning

<u>ITDG</u>	<u>AZELS</u>
<ul style="list-style-type: none"> • Persistence • Initiative and Curiosity • Creativity and Inventiveness • Reasoning and Problem Solving 	<ul style="list-style-type: none"> • Initiative and Curiosity • Attentiveness • Confidence • Creativity • Reasoning and Problem Solving

12

What is the connection?

Approaches to Learning

Cognitive Development

The Impact of Approaches to Learning on Cognitive Development

“Approaches to learning are interrelated with **executive function** skills, an umbrella term for a set of **neurologically-based processes** that involve managing one’s self and one’s resources in order to achieve a goal.” (4)

“These include the ability to remember and follow multi-step instructions, avoid distractions, control rash responses, adjust when rules change and persist at problem-solving.” (5)

Arizona’s Approaches to Learning (initiative and curiosity, attentiveness and persistence, confidence, creativity, inventiveness, reasoning and problem-solving) will prepare children for the ultimate goal of school and life-long success.

When adults provide an engaging environment that allows children to explore and create independently it helps the brain create the patterns needed for critical thinking.

Understanding Cognitive Development

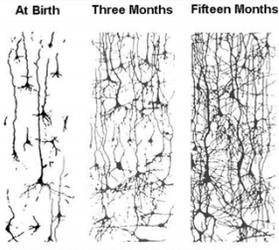
Exploring and trying to understand the world are natural and necessary for children’s cognitive or intellectual development. As children learn and grow, their **thinking capacities expand and become more flexible.**

The Program for I/T Caregivers WestEd

The Process of Cognitive Development

Adults should support and guide this process by responding to children's interests with new learning opportunities and to their questions with information and enthusiasm.

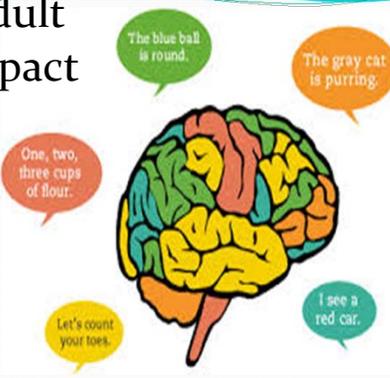
The Program for I/T Caregivers WestEd



At Birth Three Months Fifteen Months

Drawings of neural connections in the human brain.

Adult Impact



The blue ball is round.

The gray cat is purring.

One, two, three cups of flour.

Let's count your toes.

I see a red car.

Young Infants	Older Infants	Toddlers
<p>Begin cognitive or intellectual learning through their interactions with playful, caring adults in a secure environment. Some of their early learning includes becoming familiar with distance and space relationships, sounds, similarities, and differences among things, and visual perspectives from various positions.</p> <p><i>Reinforced by describing to infants what they feel, hear, touch, and see.</i></p>	<p>Actively learn through trying things out; using objects as tools; comparing; imitating; looking for lost objects; and naming familiar objects, places, and people. By giving the infants opportunities to explore space, objects, and people and by <i>sharing children's pleasure in discovery, adults can help children become confident in their ability to learn and understand.</i></p>	<p>Enter a new and expansive phase of mental activity. They are beginning to think in words and symbols, to remember, and to imagine. Their curiosity leads them to try out materials in many ways.</p> <p><i>Adults can encourage this natural interest by providing a variety of new, open-ended materials for experimentation.</i></p>

Studies consistently show that a baby learns most and fastest—and will likelier remember what he learns—when *he* can control what's happening...it's those experiences *he* chooses (not necessarily those chosen *for* him) that help him learn fastest and most completely.



Evelyn B Thoman and Sue Browder

Arizona's Infant and Toddler Developmental Guidelines

Domain IV: Cognitive Development

Components:

- Exploration and Discovery
- Memory
- Problem Solving
- Imitation and Symbolic Play

Component 1 Exploration and Discovery

What is exploration and discovery in infants and toddlers?

- Pays attention to people and objects
- Uses senses to explore people, objects and the environment
- Attends to colors, shapes, patterns or pictures
- Shows interest and curiosity in new people and objects
- Makes things happen and watches for results or repeats action



“Discoveries of Infancy”

- Discovery One: Learning Schemes
- Discovery Two: Learning That Events Are Caused
- Discovery Three: Use of Tools
- Discovery Four: Object Permanence
- Discovery Five: Learning How Objects Fill Space
- Discovery Six: Imitation

Dr. J. Ron Lally, 1995

The Caregiver’s Role



What it might look like...



Spatial Relationships

Strategy Reflection

EXAMPLES OF CAREGIVER STRATEGIES for promoting development of exploration and discovery

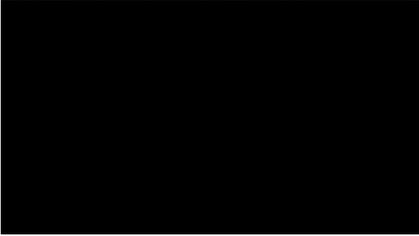
Young Infant (Birth to 8 months)	Older Infant (8 to 18 months)	Toddler (18 to 36 months)
<p>Allow baby time to explore through looking, reaching, touching and handling.</p> <p>Provide a variety of objects of different sizes, shapes, colors and textures for baby to look at and explore.</p> <p>Provide toys and experiences where baby's actions cause an interesting result.</p> <p>Place baby in a safe area, without a lot of distractions and loud noises, for time to explore and play.</p> <p>Place toys near baby and allow baby to move and reach for the toys.</p>	<p>Provide a safe environment for baby to move around and explore.</p> <p>Allow baby to explore your face, nose, hair, mouth, etc. and face.</p> <p>Provide opportunities for unstructured play and discovery time.</p> <p>Provide toys that offer possibilities for learning about size, shape and color, while using movement, reaching and touching toys.</p> <p>Comment positively when baby learns a new action or skill or adds to change.</p>	<p>Talk about what toddler sees or hears and call attention to new and unusual actions or events.</p> <p>Provide toys that challenge toddler's skills, such as push and pull toys, puzzles and sorting or matching objects.</p> <p>Explore your surroundings with toddler and look for things that are the same and things that change.</p> <p>Keep toddler entertained the effects of actions on others, such as using words to describe what's in a box or being good.</p> <p>Provide opportunities for toddler to explore and experiment nature while on walks or visits to a park.</p>



26

Component 2 Memory

Building Memory



What is memory?

- Shows ability to acquire and process new information
- Recognizes familiar people, places and things
- Recalls and uses information in new situations
- Searches for missing or hidden objects



Activity: Now and Later (Memory)

- Think about each indicator indicated on p. 49
 - Why are the indicators important for proper infant/toddler development?
 - How do these skills support children's continued development as they enter school and beyond.
- Divide a piece of chart paper in half
 - On the left side, brainstorm ideas on what this might look like in infants/toddlers...
 - On the right side, brainstorm ideas on what these behavior would look like in a kindergartner...

What it might look like...





Strategy Reflection

EXAMPLES OF CAREGIVER STRATEGIES for promoting memory

Young Infant (Birth to 8 months)	Older Infant (9 to 18 months)	Toddler (19 to 24 months)
<p>Observe baby by alone, with adult and name other people or objects that are present</p> <p>Change and rearrange objects or persons in the environment regularly to promote name rights and visual interest</p> <p>Talk about and name new people and places in the baby's social world</p> <p>Call attention to familiar and new people, objects and things that are new</p> <p>Play hiding games with baby by partially hiding a toy under a blanket or cloth</p>	<p>Communicate with baby verbally describing items, such as a rattle, a hat or a teddy bear or give an alternative name</p> <p>Play games with baby that provide opportunities for turn taking and give and take such as "peek-a-boo"</p> <p>Watch for times when baby might reject these games or activities or show reluctance and with other people</p> <p>Play hiding games with baby by placing a toy or small object under a cup or blanket and asking, "Where did it go?" or "Where is it?" while gesturing with your hands</p> <p>Allow time for baby to look for and find missing toy, bottle, pen or other person</p>	<p>Provide a consistent place, such as a box or a shelf, for toddler to keep and find things</p> <p>Bring favorite things over and over with children and comment when they bring them on their own</p> <p>Include established, simple routines or sensory activities, such as recitations or traditions, to build focus for anticipation about what happens next and create preparing for activities independently</p> <p>Play games, such as finding hidden or hidden things or persons, and vary the hiding time and length of time before looking for the object</p>



Today I will stop and listen
to their laughter.
I will breathe in their joy.
I will play and be a part of
their memories
not just the
memory maker.

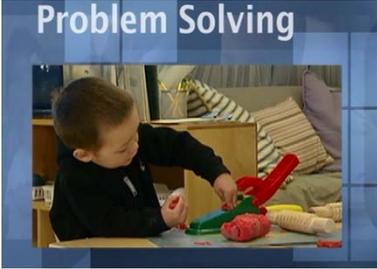
Component 3 Problem Solving

What is problem-solving?

- Experiments with different uses for objects
- Shows imagination and creativity in solving problems
- Uses a variety of strategies to solve problems
- Applies knowledge to new situations



What it might look like...



Problem Solving

Strategy Reflection

EXAMPLES OF CAREGIVER STRATEGIES for promoting problem solving

Young Infants (Birth to 8 months)	Older Infants (9 to 18 months)	Toddlers (19 to 36 months)
<p>Allow baby time to explore and examine objects and use things.</p> <p>Watch, but don't interrupt, when baby is using exploring toys or other objects.</p> <p>Consistently place objects far enough away so baby has to move to get them.</p> <p>Offer support and suggestions for problem solving, but do not intervene too quickly.</p> <p>Comment positively on baby's attempts and successes in solving problems.</p>	<p>Allow baby freedom to move and explore from things such as what baby can do with things.</p> <p>Provide a variety of interesting activities that come apart, move and can be used in many ways.</p> <p>Allow baby time to play with and explore everyday household objects.</p> <p>Show excitement when baby discovers new uses for familiar things, such as putting blocks in a hole or pit.</p> <p>Offer baby encouragement a problem, offer encouragement and support, but do not intervene too quickly.</p> <p>Notice and comment positively when baby makes a new problem or applies knowledge to new situations.</p>	<p>Set up the environment to allow time and create complete space of playing with toys and something and using materials.</p> <p>Allow toddler to choose different activities, times and stages of using things.</p> <p>Allow toddler to show their curiosity and imagination by asking questions or their own ideas.</p> <p>Ask questions and explore wonder about a problem to help toddlers think about and understand how they solved similar problems before.</p> <p>Show delight in the accomplishments, new skills and abilities that toddlers have developed.</p>



38

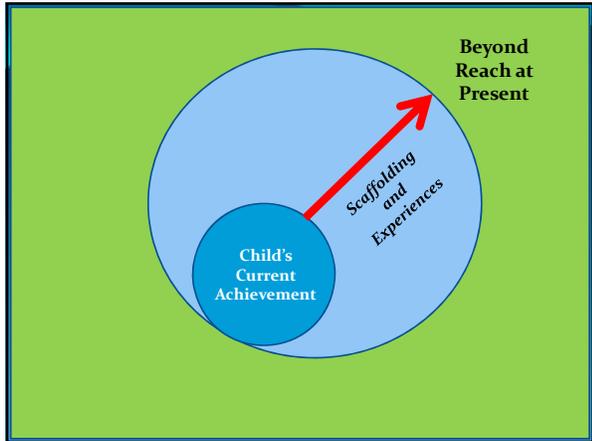
Component 4

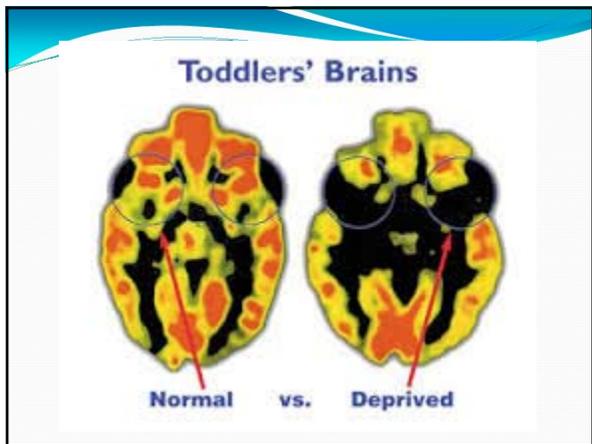
Imitation and Symbolic Play

What is imitation and symbolic play?

- Observes and imitates sounds, gestures, or behaviors
- Uses objects in new ways or in pretend play
- Uses imitation or pretend play to express creativity and imagination





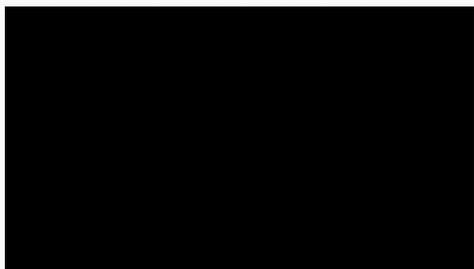


Activity: Now and Later (Imitation and Symbolic Play)

- Think about each indicator indicated on p. 53
 - Why are the indicators important for proper infant/toddler development?
 - How do these skills support children's continued development as they enter school and beyond.
- Divide a piece of chart paper in half
 - On the left side, brainstorm ideas on what this might look like in infants/toddlers...
 - On the right side, brainstorm ideas on what these behaviors would look like in a kindergartner...

What it might look like...





The Cognitive Benefits of Play: Effects on the learning brain

1. Play improves memory
2. Play stimulates growth
3. Free play improves academic performance
4. Symbolic play promotes language development
5. Pretend play encourages logic and reasoning
6. Block play enhances math skills
7. Self-directed, engaged learning with support and responsive caregiving

2006-2014 by Gwen Dewar, PhD

Strategy Reflection

EXAMPLES OF CAREGIVER STRATEGIES for promoting imitation and symbolic play

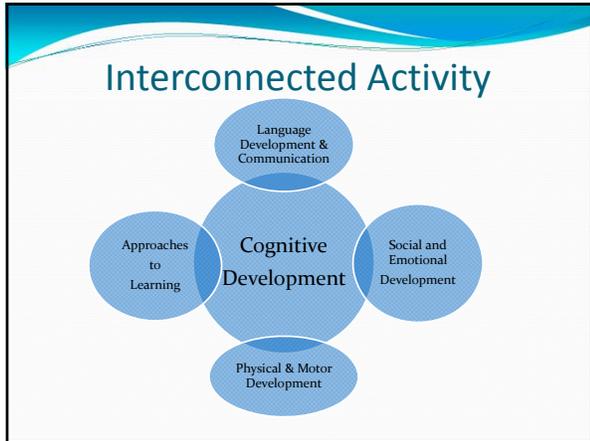
Young Infant (Birth to 8 months)	Older Infant (9 to 18 months)	Toddler (19 to 36 months)
<p>Imitate baby's faces or noises and watch to see if baby imitates you.</p> <p>Play with familiar toys, such as shaking a rattle or putting a soft toy, and allow time for baby to imitate your actions.</p> <p>Play "peek-a-boo" with baby by waving your hands to cover and uncover your face while saying, "peek-a-boo!"</p> <p>Occasionally imitate baby's gestures, actions or behavior to see if baby imitates you and then repeat or modify the gesture, action or behavior.</p>	<p>Play games and do finger plays in which baby can imitate your gestures or actions, such as "Where is your nose?" or "Where are your feet?"</p> <p>Provide real and/or toy objects, such as a rattle, spoon or telephone for pretend play.</p> <p>Provide opportunities for baby to express self-comparisons, such as washing, washing arms or legs, or dressing to music.</p>	<p>Provide opportunities for pretend play with simple props for roles, actions, such as dolls, stuffed animals, dishes and blocks.</p> <p>Model sounds that animals or cars make and observe the ways that toddler uses these sounds and toys in pretend play.</p> <p>Watch and comment positively about situations where toddler uses other objects to substitute or represent the real thing, such as using a stick for a fishing pole or a block for a pillow.</p> <p>Introduce play with sand and water and provide other sensory experiences.</p> <p>Try acting out different pretend roles during play, such as encouraging toddler to cook, make, build, feed her toy, and encourage pretend to eat it.</p>



47

Connecting to EVERYTHING we do...





Facilitating Cognitive Development

Interesting
Engaging
Intentional

Role of the Adult (Caregiver)

- Face-to-face interaction is extremely critical to the overall development, including social skills, such as facial expressions and turn-taking. Can take place:
 - Caregiver's lap
 - Infant seat
 - While laying on the floor



Responsive Caregiving

- Contingent
 - The adult's action depends on or occurs in reaction to the infant's action (matches the child's actions)
- Appropriate
 - The adult's action is conceptually related to the infant's action and is geared to fulfill the infant's need (relatable)
- Prompt
 - The adult's action follows the infant's action closely in time (make connections so that the child learns to associate the two)

Benefits of Responsive Caregiving

- Advantage in language and play
- Solve problems more efficiently
- Notice changes in environment quicker
- More skillful in sensorimotor tasks
- Greater levels of social interaction
- Vocalize more fluently
- Produce a greater proportion of speech-like sounds
- Higher IQ scores at age 12

Summary

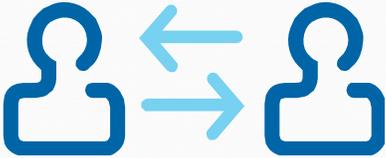
“Among the areas of **cognitive development** are information processing, intelligence, reasoning, language **development**, and memory.”

“**Cognitive development** is the construction of thought processes, including remembering, problem solving, and decision-making, from childhood through adolescence to adulthood.”

Desired Outcome

More than survive; THRIVE

Share with a partner...



Resources

- A First Look at the Common Core and College and Career Readiness. Retrieved from <http://www.act.org/commoncore/pdf/FirstLook.pdf>
- Arizona's Infant and Toddler Developmental Guidelines, 1st Edition. Retrieved from <http://www.aztlf.gov/Documents/Arizona%20Infant%20and%20Toddler%20Developmental%20Guidelines%20DRAFT%20color%20VETTING.pdf>
- Arizona's Early Learning Standards, 3rd Edition. Retrieved from <http://www.azed.gov/early-childhood/files/2011/11/arizona-early-learning-standards-3rd-edition.pdf>
- Copple et al. (2013). Developmentally Appropriate Practice: Focus on Infants and Toddlers. National Association for the Education of Young Children (NAEYC)
- Dodge, D. T. et al. (2006). The Creative Curriculum for Infants, Toddlers & Twos: Second Edition. Teaching Strategies, Inc. Washington, D.C.
- Gopnik, Allison. What Do Babies Think. Retrieved from http://www.ted.com/talks/allison_gopnik_what_do_babies_think
- Looking at Behavior video clip 3.2 (Module 3) from *Promoting the Social and Emotional Competence of Infants and Toddlers*. The Center on the Social and Emotional Foundations for Early Learning. (CSEFEL) Retrieved from http://csefel.vanderbilt.edu/resources/training_infant.html
- Schickedanz, J. & Collins, M. (2013). So Much More Than the ABCs: The Early Phases of Reading and Writing. National Association for the Education of Young Children (NAEYC)
- Teachstone, 2013. Toddler CLASS Participant Guide, V2.1

Questions?

A photograph of a young child with light hair, sitting and resting their chin on their hand in a thoughtful pose. The child is looking towards the camera with a slight smile.

“As for the future, your task is not to foresee it, but to enable it.

~ Antoine de Saint-Exupery
