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## **Bayley Scales of Infant and Toddler Development: 4 Administering a Reliable Bayley for Research- Part I**

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# Disclosures and disclaimer

## **Disclosures**

*I served as a consultant to the Pearson Corp and Dr. Glen Aylward (Bayley IV author) during the development of the Bayley 4, primarily in 2017 and 2018; however, I am not currently receiving any financial compensation or support from Pearson or Dr. Aylward.*

*My interest in the use of the Bayley Scales assessment instrument comes from several decades of experience with this tool in research and clinical applications.*

## **Disclaimer**

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# History of the Bayley Scales: Nancy Bayley, PhD (1899-1994)



- Pioneer in field of human development
- Devoted life to lifespan mental and physical development
  - Much of what we know about development attributable to Dr. Bayley
- Longitudinal studies of physical and behavioral development
  - Example: Berkeley Growth Study
  - Followed 50,000+ children over her career
- Over 200 publications about human development
- Scientific awards and recognition
  - Head of Child Development section of NIMH (1954)
  - 1<sup>st</sup> woman to win APA Distinguished Scientific Contribution Award (1966)
  - APA Gold Medal Award (1982)
  - Distinguished Contribution Award – SRCD (1983)
  - Fellow in the APA and American Association for the Advancement

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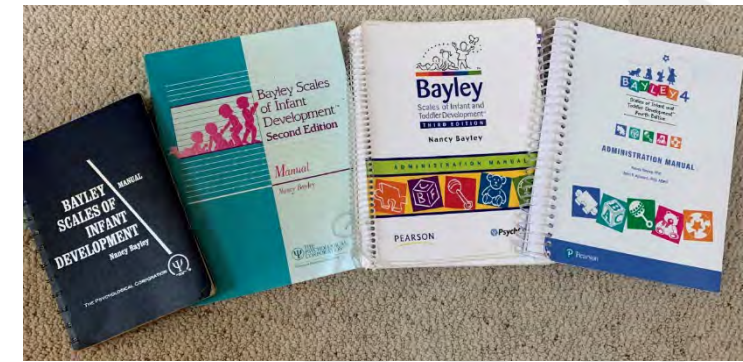
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# History of the Bayley Scales

- All editions use standardized administration and scoring
- Observed behavioral responses were used to develop age-based norms
- Norms used for comparing a child's performance against peers
- Bayley is **power test**
  - *Items/skills arranged in order of increasing difficulty*
- Scales derived from Nancy Bayley's California scales **1933-1936**
  - California First Year Mental Scale 1933 and California Scale of Infant Motor Development 1936
- Bayley Scales of Infant Development (1<sup>st</sup> Ed) **1969**
  - Mental Scale and Motor Scale
  - 2-30 months
- Bayley Scales of Infant Development (2<sup>nd</sup> Ed.) **1993**
  - Mental Development Index (MDI) and Psychomotor Development Index (PDI)
  - Expanded age range to 1-42 months
- Bayley Scales of Infant and Toddler Development (3<sup>rd</sup> Ed) **2006**
  - Expanded to Five domain model – Cog, RL, EL, FM, GM
  - Age range 1-42 months



# Bayley Scales of Infant and Toddler Development – 4 (2019)



# What is the Bayley - 4

- Individually administered assessment instrument designed to assess development in young children ages 1-42 months (technically 16 days – 42m; 30d)
- Assessment of infant and toddler development in
  - cognitive, language, motor development – examiner administered tool
  - socioemotional and adaptive development – parent questionnaire
- Uses:
  - Clinical Use - Identify areas of developmental delay and need for early intervention
  - Research Use - compare research participants with typically developing children in norm group
  - Clinical and research use: Longitudinal monitoring of developmental change over time



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# Goals of the Bayley – 4 Revision

- Adhere to developmental philosophy of Nancy Bayley
  - Maintain basic qualities and format
- Inclusion of a polytomous scoring
  - Differentiate: absence, emergence, mastery of skill
- Include caregivers to increase validity
  - Address issues of child refusal; shyness
- Reduce test duration
  - Balance need for robust item set with reality of assessing children
  - Reduce or combine highly correlated items
- Simplify administration
- Improve content coverage (floor and ceiling)
- Improve sensitivity and clinical utility
  - Used special group studies to evaluate clinical utility (e.g. preterm, Down Syndrome, ASD, etc.)
- Update norms to modern cohort of children
  - Flynn Effect: 3-5 point composite score increase per decade



# Development of the Bayley-4

## INITIAL DEVELOPMENT

- Conceptual Development
- Pilot Research with about 150 children
- Advisory Panel; Expert Reviewers, Consultants
- Try Out Edition with 703 nationally-representative children 0-42 months

## STANDARDIZATION:

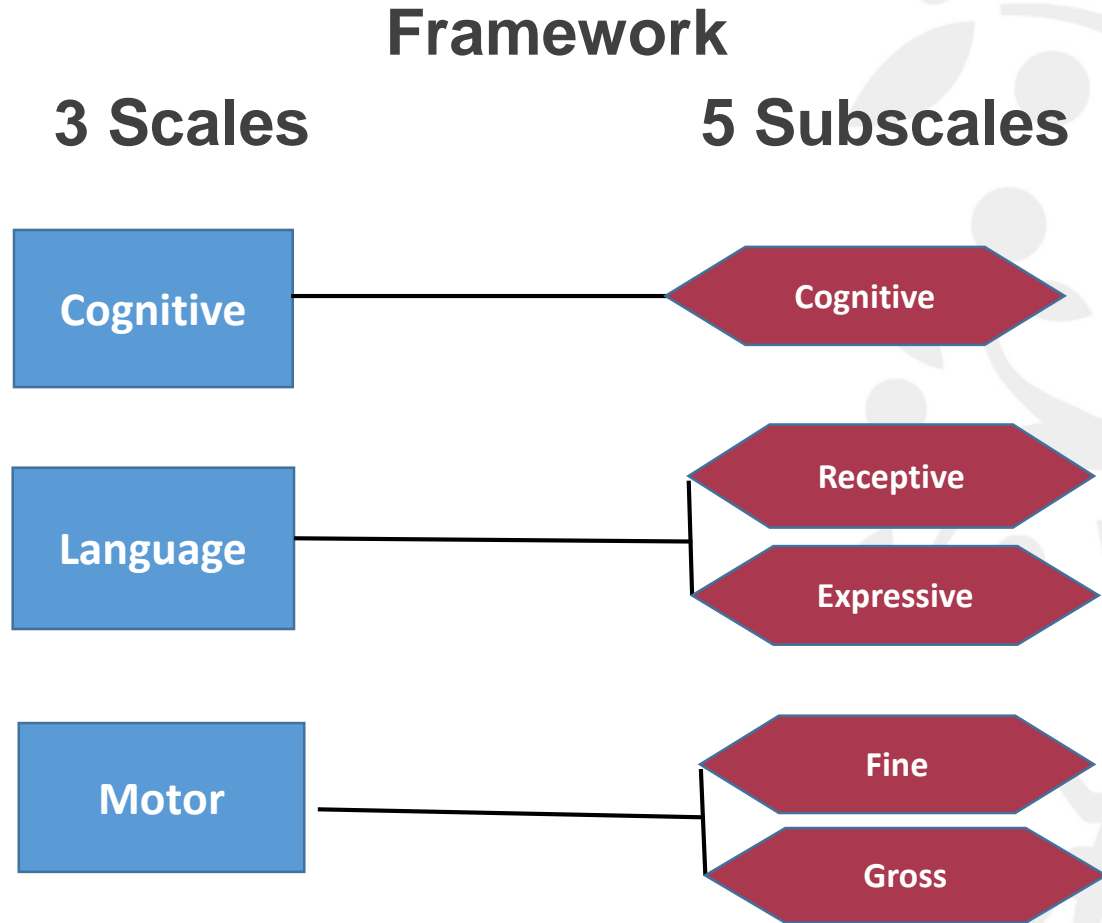
- Standardization Phase with 1,700 typically developing children
  - 1-42 months
  - 17 age groupings
  - 100 children per group
- Excluded children with known conditions
  - 34 children with Down syndrome
  - Attempt to increase variance at lower end of normal distribution
  - 2 Down syndrome children in each age group
- Nationally representative sample
  - U.S. Census provided basis for stratification
  - Gender, race/ethnicity, parent education, U.S. region





# Framework of Bayley Scales of Infant and Toddler Development-4

- Norm referenced -Chronological or Corrected Age
- Composite Score (Scales):  
Mean = 100 SD=15  
Average scores 90-110
- Scaled Scores (Subscales)  
Mean = 10; SD=3  
Average scores = 8-12



# Types of scores available

- Composite Scores (Mean = 100; SD =15; range 45-155)
  - Cognitive, Language, Motor
- Percentile Ranks
- Scaled Scores (Mean = 10; SD = 3; range 1-19)
  - COG, RL, EL, FM, and GM
- Developmental Age Equivalents
  - Not psychometrically sound
  - Useful for very low functioning individuals
  - Range <0:20 to >41:08
- Growth Scores
  - Useful for comparisons across time
  - Useful for very low functioning individuals

**Record Form**

**BAYLEY 4**  
Scales of Infant and Toddler Development  
Fourth Edition

Child's name: \_\_\_\_\_  
Sex: ☐ M ☐ F  
Examiner's name: \_\_\_\_\_  
Reason for referral: \_\_\_\_\_

**Calculation of Child's Age**

Test date	Year	Month	Day
Birth date			
Test age			
Test age in months and days	Years x 12	Months	Total months Days

**Adjustment for Prematurity**

Test date	Year	Month	Day
Expected birth date			
Adjusted test age			
Adjusted test age in months and days	Years x 12	Months	Total months Days

**Start Points**

Test age/adjusted test age	Start point
0 months 16 days – 1 month 30 days	A
2 months 0 days – 2 months 30 days	B
3 months 0 days – 3 months 30 days	C
4 months 0 days – 4 months 30 days	D
5 months 0 days – 5 months 30 days	E
6 months 0 days – 6 months 30 days	F
7 months 0 days – 7 months 30 days	G
8 months 0 days – 10 months 30 days	H
11 months 0 days – 13 months 30 days	I
14 months 0 days – 16 months 30 days	J
17 months 0 days – 19 months 30 days	K
20 months 0 days – 22 months 30 days	L
23 months 0 days – 25 months 30 days	M
26 months 0 days – 28 months 30 days	N
29 months 0 days – 32 months 30 days	O
33 months 0 days – 38 months 30 days	P
39 months 0 days – 42 months 30 days	Q

**Summary**

**Total Raw Score to Scaled Score Conversion**

Subtest	Raw score	Scaled score (Table A.1)	Age equivalent (Table B.1)	Growth scale value (Table B.2)
Cognitive (CG)				
Receptive Communication (RC)				
Expressive Communication (EC)				
Sum of scaled scores				
Fine Motor (FM)				
Gross Motor (GM)				
Sum of scaled scores				

**Sum of Scaled Scores to Standard Score Conversion**

Scale	Sum of scaled scores	Standard score (Table A.6)	Percentile rank	Confidence interval (%)
COG				
LANG				
MOT				

**Social-Emotional and Adaptive Behavior Raw and Scaled Scores**

Subtest/subdomain	SE	REG	EXP	PER	IPR	PLA
Raw score						
Scaled score						

Pearson  
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1 2 3 4 5 6 7 8 9 10 11 12 A B C D E  
Product Number A10200160004

# Paper vs Digital Administration



## Traditional Paper Administration

- Follow administration guidelines in chapter 4 of manual
- Responses and scores recorded on Bayley 4 Record form
- Similar to Bayley 3
- Advantages
  - Familiarity to examiner
  - Portability
- Disadvantages
  - Administration instructions not comprehensive
  - Requires considerable examiner knowledge/expertise with test

## Digital Administration

- Combines administration guidelines & Record form
- Advantages:
  - Guides examiner → administration & scoring
  - Potentially enhances adherence to standardization
- Disadvantages:
  - Cost – iPad
  - Q-global per evaluation score fee (\$5 each)
  - iPad distraction to child/examiner
  - Examiner less proficient -dependent on digital format
  - Need to release PHI to outside organization

# Standardized Assessment with the Bayley-4



# What is a standardized assessment?

- The Bayley – 4 is a standardized test and the norms/norm tables were established based on **uniform testing conditions** meaning that standard administration and scoring procedures were used.
- In order for the normative data to be utilized to obtain scores for any child, the Bayley administration **MUST** conform to those same *uniform testing conditions*. (administered according to the procedures in Chapter 4)
- Deviations from the standard procedures, such as changes in the wording of instruction, layout of materials, or presentation of a test item will reduce the reliability and validity of the test results and the raw scores would not be interpretable using the nationally derived norms.
- **Thus, examiners MUST administer exactly according to manual**

# Administering a reliable Bayley-4 for research

- Keep number of individuals in the room to a minimum
- Optimal - Child, 1 Caregiver, Examiner
  - Bayley 4 – Caregiver *very familiar* with child's skills is essential
- Acceptable – Child, 2 Caregivers, Examiner
  - Or one caregiver and one videographer
  - Or use iPad/video camera on tripod
- Not Acceptable – multiple other adults; siblings; observers; medical staff
  - Use one-way mirror, if available, for other adults/observers
  - Extra relatives should wait in waiting room



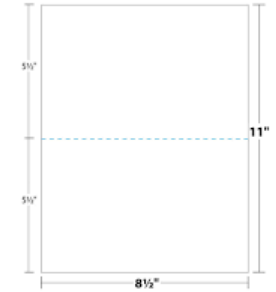


# Preparing for Bayley-4 administration



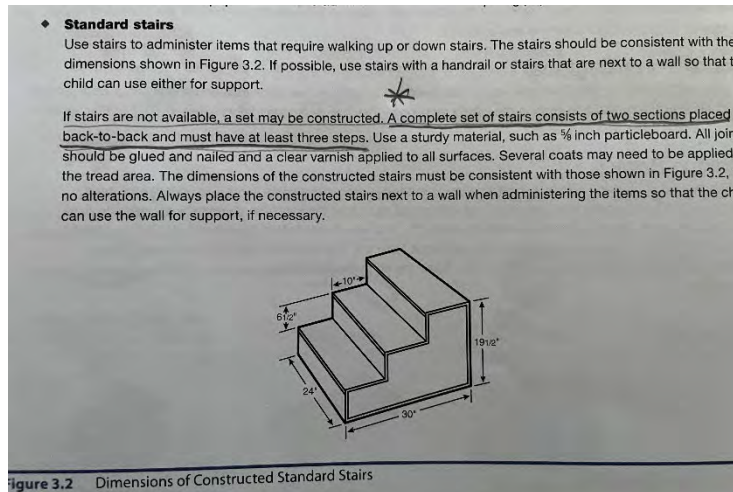
# Required Materials Provided by Examiner

- **Stopwatch** or use your phone (some disadvantages to phone)
- **Blue painters tape** – tape stepping path to floor
- **Tissues** – Cog 44-relational play; RL 21-follows 1-part directions
- **Food pellets** – Cheerios recommended
- **Object to hide behind** - Cog 24 - anticipatory gaze -Clipboard recommended (may not need for NRN age)
- **Sheets of paper** – Cut in half for Cog 18- Plays with paper
- **Extra toys (can get from child if child brings anything–** for RL 13 (toys not used in RL 16)
  - Examples bottle/cup, pacifier, child shoe, phone, keys, etc.



# Required Materials provided by examiner: Stairs!

- **Stairs** – approximate 6 ½ inch rise and 10 inch run
  - May use stairs available in your facility
    - IF of appropriate size
    - MUST have handrail/wall for child to hold
  - Or construct set from manual page 16 and place against a wall



**Option: Modified single set if space is limited**

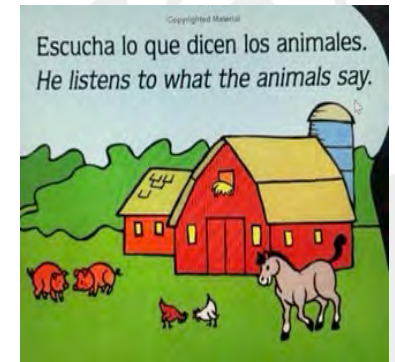
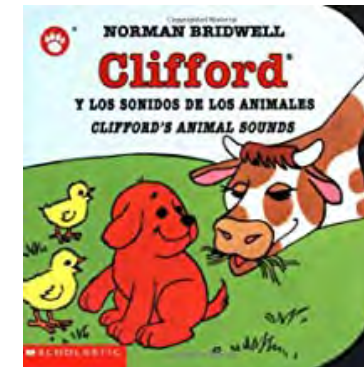
# Additional Materials **Strongly** Recommended

- **Extra Objects/Toys** – for RL 13: Recognizes Words
  - “Ask caregiver to choose 5 objects the child is familiar with”
  - Can use toys from kit not used for other language items
  - Not much to choose from so have some other common objects available
  - Can use child’s own objects – shoe, cup, bottle, etc.



- **Clifford Book written in Spanish**
  - Clifford’s Animal Sounds
  - For Cog #41 Listens to story (parent reads)

- **Unsharpened Ticonderoga Fat Pencil**
  - For Cog #48 Uses pencil to obtain object





# Organize Test Kit and Materials in Advance of Administration

- Ideally, have test kit out of child's sight
- Organize test kit and arrange/set up materials BEFORE assessment begins
  - Assemble pegboard, pink puzzle; Duplo blocks, etc.
  - Open stimulus book to first page needed; keep it open for next item
- Store puzzle pieces, blocks, etc. in plastic containers (not bags) for ease of access and cleaning
- Use bins for used/dirty toys
- Clipboard for booklet and stopwatch ready
- NEVER wait to set up or dig through disorganized pile of toys during assessment or with child in the room – wastes precious minutes
- Items easy to lose –check kit regularly for missing items and re-order from Pearson

# Examples of set up methods and options



Set up in open test kit



Set up on table to side of test table



Rolling cart with drawer carts



Plastic tubs

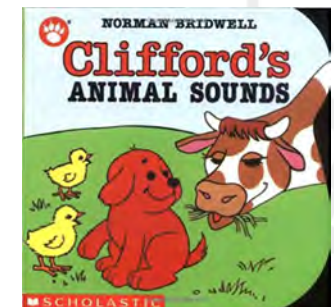
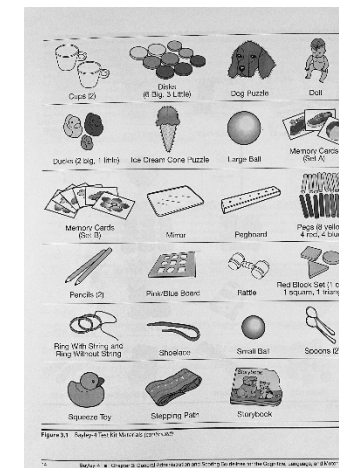
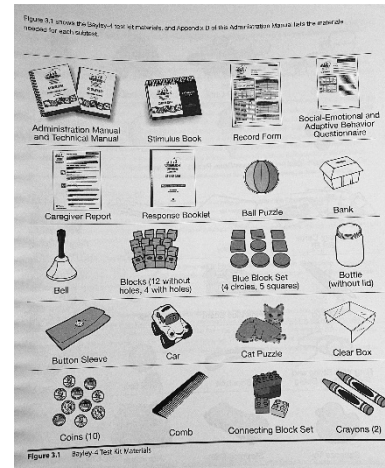


Plastic Bins



# Bayley-IV Assessment Toys

- Check kit regularly for lost/missing items and re-order from Pearson
- **Never** substitute non-Bayley toys
  - May changes item difficulty
  - Example – larger ball (easier to kick) or smaller car (harder to hold) changes difficulty of tasks
  - Contact Pearson directly; more available than website indicates
  - Exceptions
    - Crayons –okay to purchase **large-sized** crayons from other retailers
    - Clifford books widely available



Materials List: Manual pages 13 & 14

# Bayley-4 Administration



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# Determine Start Point Based on Child Age

- Calculate child age in months and days
  - Use method in manual on page 26
  - Use online age calculator – Pearson directs examiners to this one
    - <https://www.calculator.net/age-calculator.html> or use Pearson App
  - Corrected age calculator for preemies on NRN website
    - Uses gestational age at birth in weeks **and** days
    - <https://neonatal.rti.org/index.cfm?fuseaction=AdjustedAgeCalculator.main>
- Use age in months and days to find start point using Start Point table on front of booklet
  - All subsections start at this level
  - Find the relevant start point page for each subsection- turn down page corner
  - Example:
    - Cognitive Start Point M; page 7; item 33
    - Receptive Language Start Point M; page 19; item 14
    - Expressive Language Start Point M; page 26; item 8
    - Fine Motor Start Point M; page 33; item 18
    - Gross Motor Start Point M; page 44; item 36

**Record Form**

Child's name: CHLOE  
 Sex: ☒ M ☐ F  
 Examiner's name: KEG  
 Reason for referral: ECDD

**Calculation of Child's Age**

Year	Month	Day
2022	01	20
Birth date	2019	12
Test date	2	01
Test age in months and days	24	1
Years x 12	288	
Months	1	
Total months	289	
Days	01	

**Adjustment for Prematurity**

Year	Month	Day
Test date		
Expected birth date		
Adjusted test age		
Adjusted test age in months and days		

**Start Points**

Test age/adjusted test age	Start point
0 months 16 days – 1 month 30 days	A
2 months 0 days – 2 months 30 days	B
3 months 0 days – 3 months 30 days	C
4 months 0 days – 4 months 30 days	D
5 months 0 days – 5 months 30 days	E
6 months 0 days – 6 months 30 days	F
7 months 0 days – 7 months 30 days	G
8 months 0 days – 8 months 30 days	H
9 months 0 days – 9 months 30 days	I
10 months 0 days – 10 months 30 days	J
11 months 0 days – 11 months 30 days	K
12 months 0 days – 12 months 30 days	L
13 months 0 days – 13 months 30 days	M
14 months 0 days – 14 months 30 days	N
15 months 0 days – 15 months 30 days	O
16 months 0 days – 16 months 30 days	P
17 months 0 days – 17 months 30 days	Q

**Summary**

Subtest	Raw score	Scaled score (Table A.1)	Age equivalent (Table B.1)	Growth scale value (Table B.2)
Cognitive (CG)				
Receptive Communication (RC)				
Expressive Communication (EC)				
Sum of scaled scores				
Fine Motor (FM)				
Gross Motor (GM)				
Sum of scaled scores				

**Sum of Scaled Scores to Standard Score Conversion**

Scale	Sum of scaled scores	Standard score (Table A.4)	Percentile rank	Confidence interval (%)
COG	1			
LANG	2			
MOT	3			

**and Adaptive Behavior Raw and Scaled Scores**

Subtest/subdomain	SE	REC	EXP	PER	IPR	PLA
Raw score						
Scaled score						



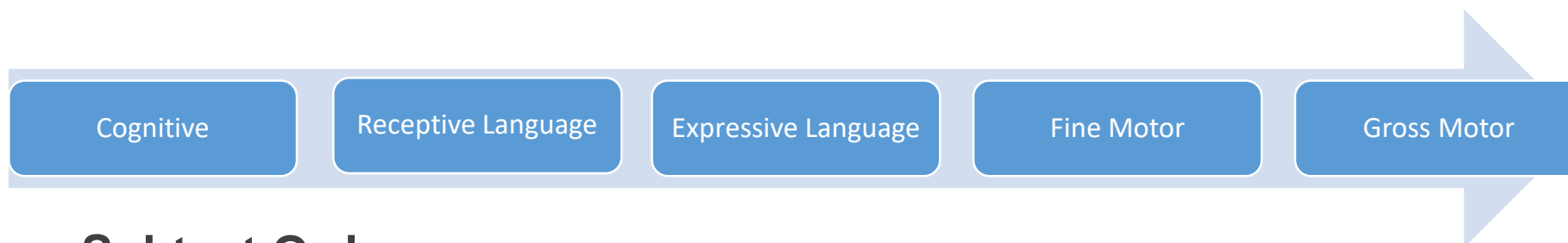
R 28   37	32. Finds Hidden Object	2 cups, 1 block	Shows no interest in pushing car or is only interested in details (e.g., wheels).
30   42			Comments:
32   45			Finds block by looking first under correct cup on both sides in either
			Finds block by looking first under correct cup on only 1 side in either
			Does not attempt to find block or is unsuccessful in finding block.
			Comments:
R 14   33	33. Suspends Ring	Ring with string	Obtains ring and suspends it by string without ring touching table.
22		Note. Ring with string items are also in the Fine Motor subtest.	Obtains ring and suspends it, but ring touches table.
			Obtains ring but does not suspend it or only plays with ring or string.
			Comments:

# Introducing Bayley-4 to parent/caregiver

- It is *extremely* important to introduce the test to the parent correctly, or parents will end up spoiling items.
- Explain that it is a standardized test; you have to administer in the same way with every child using exactly the same words and number of trials.
- Say you want to see what the child can figure out all by themselves (even though parents teach children at home).
- But that you will also ask about skills at home for some tasks
- Ask them not to talk to child except to say “yay” or “good job,” and to follow your lead about when to praise the child
- Provide reassurance that it is okay if the child does not demonstrate all their skills or is noncompliant with some requests.
  - This is true for all children, even the children on whom the test was developed and normed.
  - Therefore, the scoring accounts for noncompliance and underperformance of some skills.



# Optimal Order of Administration:



- **Subtest Order**

- Can use Fine Motor or Gross Motor as a break between two language scales
- Important: Receptive Language *must* be before Expressive Language
- Do not jump back and forth between items from different domains

- **Item Order**

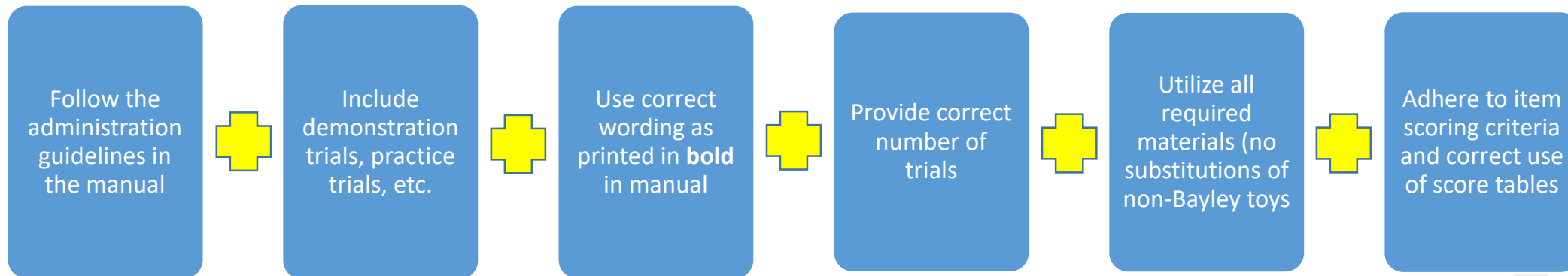
- Present items in order listed/described in manual
  - Arranged in order of difficulty
  - Designed to facilitate engagement; order of difficulty
- Some flexibility is acceptable





# Administering a research reliable Bayley 4

Examiner's task is to do all of the following:



 Reliable Bayley



# Bayley 4 - Test Duration time

- Pearson reported test time data:

Age	50%	75%	90%	95%
1-12 mo.	35 min.	50 min.	73 min.	86 min.
13-24 mo.	63 min.	84 min.	103 min.	111 min.
25-42 mo.	68 min.	88 min.	102 min.	108 min.

- BUT....our experiences suggests may be **longer** than times reported especially with less familiar examiners or with fussy children
- Therefore - must become VERY familiar with Bayley 4 to facilitate smooth administration



# Shared Cognitive and Receptive Language items

- Incorporated to save time
  - Administer/observe once – score in both sections
  - However, they are mostly early items

Item	Cognitive Item	Receptive Language Item
Recognizer caregiver	5	4
Reaction to caregiver	6	6
Shifts attention	8	7
Explores Object	13	9
Brings to Mouth	14	10
Bangs Objects	19	11



# Bayley-4: Three-point Scoring (Polytomous scoring)

**Bayley 4:** Polytomous/Three-point scoring - more consistent with our knowledge of developmental growth



# Basal, Reversal and Discontinue Rules

- Basal, Reversal, and Ceiling Rules are the same across all subtests
- **Basal Rule:** Child must receive a **score of 2** on the first THREE consecutive items at his or her start point
- **Reversal Rule:** If a child receives an “**imperfect score**” (score of 0 or 1) on any of the first three items, go back to the previous start point
- **Discontinue Rule/Ceiling:** When the child receives **scores of 0** for FIVE consecutive items



# Ceiling/Discontinue Rules on Bayley-4

- **Five consecutive 0-point items**
- Seems to add length to assessment as ceiling is more difficult to get
- Not uncommon to obtain four 0-point items and then a 1-point score; need to continue on with five more difficult items
- Example
  - Cog 55 - Blue puzzle series - 9 pieces (0 = less than 5) - child earns 0
  - Cog 56 - Spatial Memory 3 Cards - child earns 0
  - Cog 57 - Imitates 2-step action - child earns 0
  - Cog 58 - Matches 3 Colors - child earns 0
  - Cog 59 - Imaginary Play - Caregiver Question
    - “When playing, does (child name) use imaginary objects?”
    - Can you give me some examples of him/her using imaginary objects?
      - List of examples in manual

If the caregiver says yes, ask, **Can you give me some examples of [him/her] using imaginary objects?**

If the caregiver requires further explanation, provide the following examples:

- ◆ Brushing a doll's hair with an imaginary comb
- ◆ Sitting in chair and pretending to drive by turning an imaginary steering wheel
- ◆ Licking an imaginary ice cream cone
- ◆ Covering a doll with an imaginary cover
- ◆ Cupping one hand as a bowl and using an imaginary spoon to eat soup
- ◆ Putting imaginary food on a plate
- ◆ Walking an imaginary pet
- ◆ Brushing teeth with an imaginary toothbrush

# Surpassed Skills

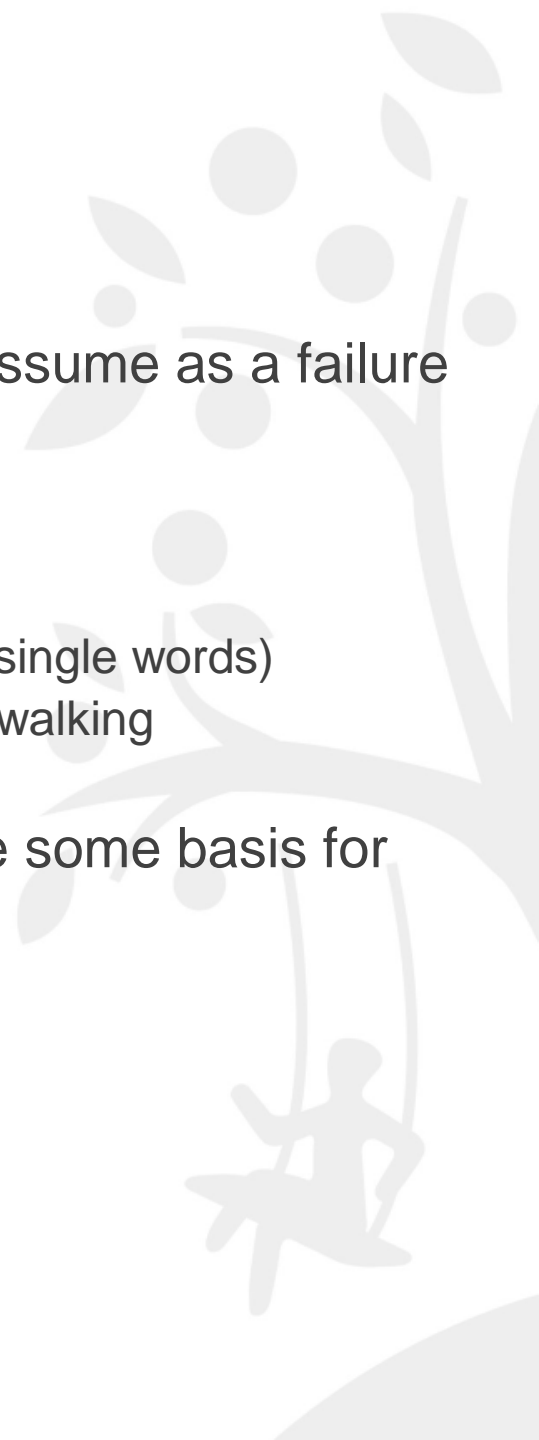
- In order to increase sensitivity, age sets are now **very** broad
- Often start at very easy items, can frustrate children
- **A surpassed skill** = child does not exhibit a skill because child has outgrown this skill and moved on to more complex skill
- Nancy Bayley discusses this concept in earlier versions (e.g. Bayley-I)
- Child receives credit for “surpassed” skills
- Can be an issue with Bayley 4 given broad age sets
  - Complex clinical decision with children with atypical development
  - Example; Start at K; Cog item 27 but need to reverse
    - Previous start point is item 19 - Bangs object
    - Child may have exceeded this skill; no longer developmentally appropriate
      - Okay to assume a PASS for items they have likely exceeded developmentally
  - Example; Start point L or M; EL item 8
    - Consonant vowel combinations – bah, dah, dee, ga
    - Child is verbal and uses lots of words with different consonant sounds (says ball, dad, mom, go) can assume this is a pass





# Assumed Failures: Use Cautiously

- When children do not have the requisite skills to complete a task = okay to assume as a failure
- In these instances, it is not feasible to administer the item
- Examples of assumed failure items
  - Cognitive: #64 Repeats Words (child is not yet imitating or using any words)
  - EC: #23 (2-word phrase), 25 (3-word phrase) & 37 (4-5 word phrase) (child only has single words)
  - GM: any item that must be administered while standing if the child is not yet standing/walking independently.
- Don't just assume failure because you “think” the child can't pass; must have some basis for the decision
  - When in doubt; try it!!



# Bayley-4 Sources of Assessment Data

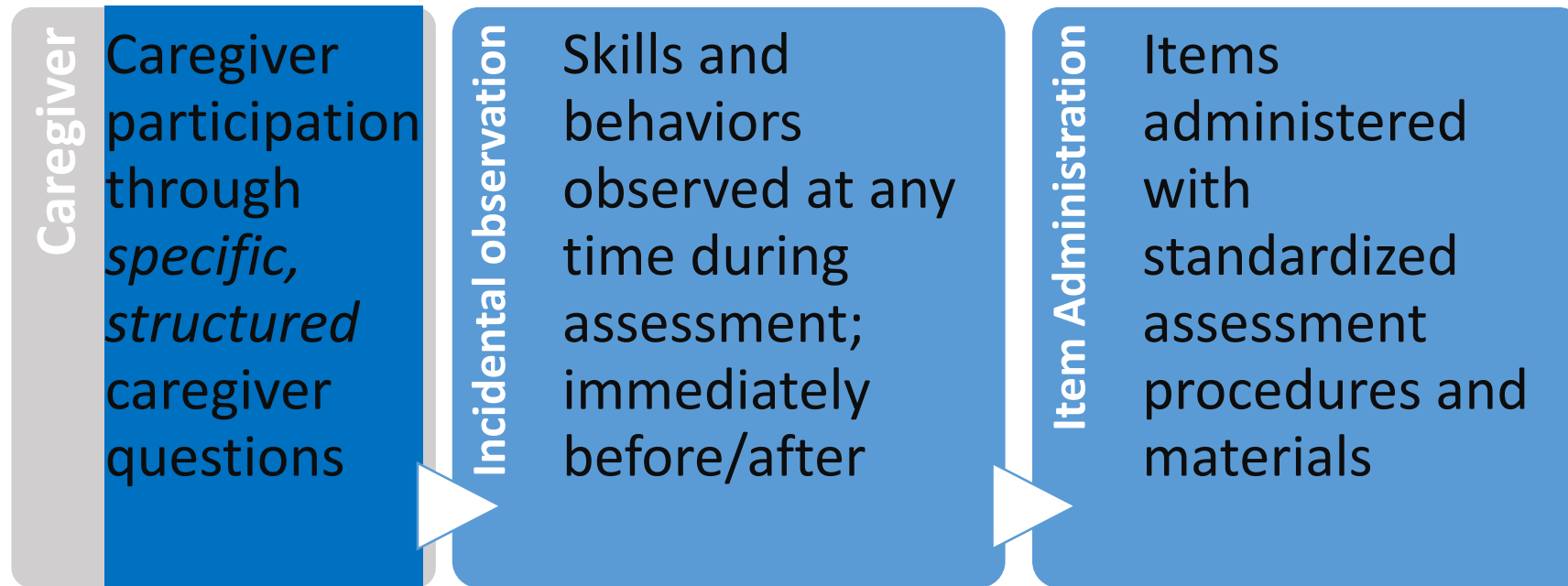
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# Bayley-4: Uses Three Data Sources



# I. Sources of Data

*Caregiver questions*

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# Sources of Data: Caregiver Questions

- Caregiver questions
  - 51 items include caregiver questions
  - Only 4 of 51 items solely based on parent report
  - Highest frequency on Expressive Language
- Goal - to address issues of child refusal; shyness
  - Expressive Language most commonly refused items
  - Parents commonly report child underperformed
- “Caregiver” - someone with frequent, extended contact with child; knowledge of child’s skills
- Manual notes frequent discrepancies between observed skills and parent report raises questions regarding validity
  - But no guidance regarding what to do in this circumstance



# Sources of Data: Caregiver Questions

***THEREFORE.....VERY IMPORTANT.....***

- ***Use Caregiver Questions ONLY if the behavior has not been observed. Not meant to replace initial administration of items***
  - ***NEVER rely only on caregiver questions; must first attempt item with child***
  - ***NEVER rely on caregiver questions just to speed up assessment***
  - ***NEVER use caregiver questions ONLY to improve score***
- ***Use caregiver follow up question only if the child's behavior makes scoring ambiguous, if the child is particularly uncooperative, or if you have reason to think the child would demonstrate better skill in a different setting.***



# Examples of Caregiver Questions – Cautious use

41	Listens to Story	
Materials	Position	
Storybook	Seated	

**Item Instructions**  
Place the storybook on the table, in front of the child. Open it to the first page and say, **Look!** Allow the child to explore the book, look at the pictures, and turn the pages.  
Have the caregiver say, **Let's read the story.** Have the caregiver retrieve the book from the child, open it, and begin reading by saying, **Listen.**  
Observe if the child attends to the story (i.e., decreases motor activity and looks at the pictures, listens to the words, or talks to the caregiver about the pictures as story is read). Disregard brief lapses of attention.

**Score**  
**2 points:** Attends to story the entire time with only brief lapses in attention.  
**1 point:** Attends to story for only a short time.  
**0 points:** Shows no interest in book or does not attend to story.

**Caregiver Question**  
Ask the caregiver, **When you read to [insert child's name], does [he/she] pay attention to the entire story almost every time, some of the time, or none of the time?**

**Score**  
**2 points:** Almost every time  
**1 point:** Some of the time  
**0 points:** None of the time

**R Related Items**  
26 Looks at Pictures  
41 Listens to Story

**STORYBOOK**

48	Jumps: Both Feet	
Materials	Position	
None	Standing	

**Item Instructions**  
While the child is standing, take a small jump and say, **Watch me jump. Now it's your turn.**

**Score**  
**2 points:** Jumps off floor with feet together or leads with 1 foot and both feet are in the air at some point during jump.  
**1 point:** Jumps but only 1 foot is in the air.  
**0 points:** Bends legs in an attempt to jump, but both feet remain in contact with floor.

**Caregiver Question**  
Ask the caregiver, **Is [insert child's name] able to jump off the floor with both feet in the air at the same time almost every time [he/she] tries, some of the time, or none of the time?**


**Score**  
**2 points:** Almost every time  
**1 point:** Some of the time  
**0 points:** None of the time

**R Related Items**  
47 Jumps Forward Series: 6 Inches  
48 Jumps: Both Feet  
55 Hops 5 Ft  
58 Jumps Forward Series: 24 Inches

**JUMP**

- Never rely exclusively on caregiver report (except for 4 caregiver only questions)
- Never use just to save time
- Never use just to improve score
- Only use if child's behavior interferes with obtaining valid score

# Example of Caregiver-Question-Only Item:



50 Representational Play	
Materials	Position
None	Not specified

**Item Instructions**

Ask the caregiver, **When playing, does [insert child's name] make-believe an object is something else, like pretending a ball is a piece of fruit?**

If the caregiver says no, score 0.

If the caregiver says yes, ask, **Can you give me some examples of other ways that [he/she] make-believes an object is something else?**

If the caregiver requires further explanation, provide the following examples:

- ◆ A bucket as a hat
- ◆ A block as a phone
- ◆ Beads as some type of food
- ◆ A small towel as a blanket

The ball-is-a-piece-of-fruit example can be included in the total.

**Score**

**2 points:** Caregiver provides at least 2 examples.

**1 point:** Caregiver provides 1 example.

**0 points:** Caregiver provides 0 examples.

**Related Items**

	PLAY
39	Relational Play: Self
44	Relational Play: Others
50	Representational Play
59	Imaginary Play

- Four questions are Caregiver Question Only
- Item instructions appear in booklet
- Additional examples not in booklet
  - Write in booklet, on index card, or memorize
- Scoring is based on number of examples parents provides
- Do not read as a yes-no list; just use a few as examples
- Importance of encouraging less communicative, shy, or quiet parents

# Caregiver Questions: Three-Point Scoring

Caregiver Response	Score	Description
<b>Almost Every Time/Often</b>	<b>2</b>	<ul style="list-style-type: none"><li>• Child is consistently able to perform a task when he/she tries</li><li>• Child responds the same way almost every time;</li><li>• Child is able to perform task <b>75% of the time</b></li></ul>
<b>Some of the Time/Not Often</b>	<b>1</b>	<ul style="list-style-type: none"><li>• Child performs task inconsistently or intermittently when he/she tries</li><li>• Child responds the same way only some of the time</li><li>• Child is able to perform <b>less than 75% of time</b></li></ul>
<b>None of the time/Not a lot</b>	<b>0</b>	<ul style="list-style-type: none"><li>• Caregiver reports skill or behavior is not yet present in any form</li><li>• Child attempts but is not successful</li><li>• Child is not yet able to perform task when given opportunity</li></ul>

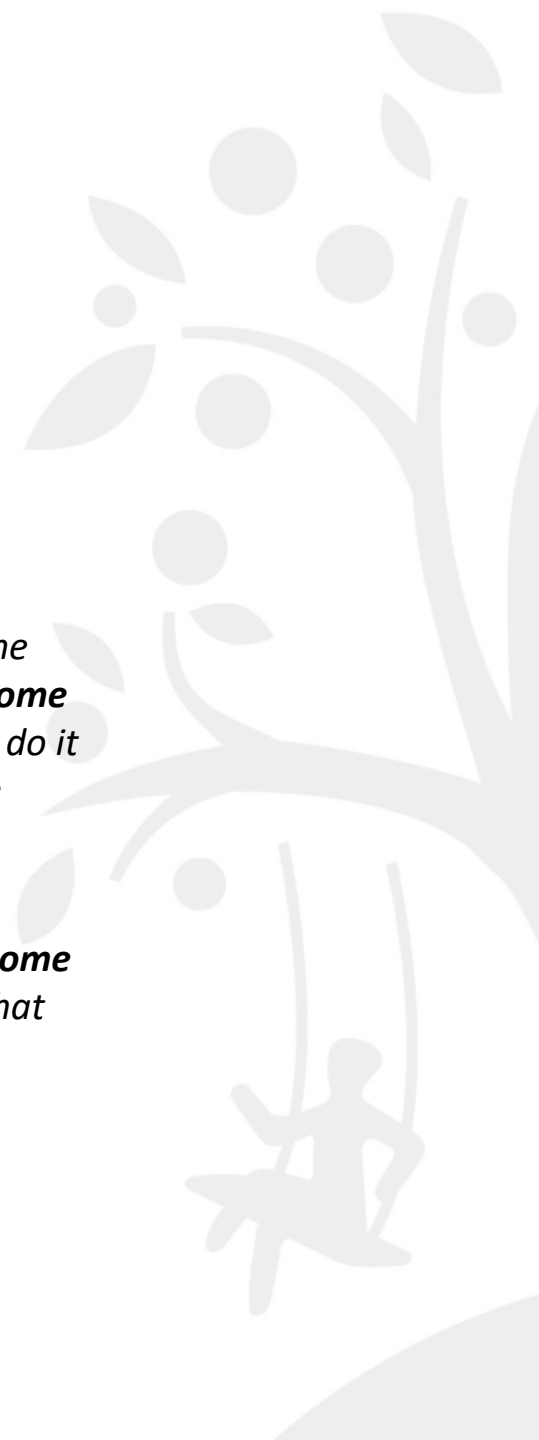
# MUST Explain Caregiver Questions to Parents!

- It is essential that parent understands the difference between almost every time/often and some of the time/not often ratings
- Bayley provides script examples (*make an index card to use during administration*)

*“Almost every time or Often means that [child name] is able to do something at least 75% or three-fourths of the time that [he/she] tries or that you observe [child name] doing the behavior 75% of the time. You would say **Some of the time or Not often** if you have seen [child name] do it at least one time, but [he/she] cannot or does not do it at least 75% of the time when [he/she] tries, or you do not observe [child name] doing the behavior 75% of the time.”*

Or

*“Almost every time or Often means that you see [child name] consistently doing the behavior with success. **Some of the time or Not Often** means that you may see [him/her] do something but not always with success, or that you only see [him/her] try to do something every now and then but not all the time.”*



## II. Sources of Data:

### ***Incidental Observation***



# Incidental Observation

- Incidental observation: Items scored based on observation during any portion of assessment
- Usually items not requiring materials or non-specified materials (e.g. COG 19: Bangs object – any object is fine)
- Incidental Observation per scale
  - Cognitive 10/81 **12%**
  - Receptive Language 10/42 **24%**
  - Expressive Language 27/37 **73%**
  - Fine Motor 14/46 **30%**
  - Gross Motor 37/58 **64%**





# Sources of data: Incidental observation

- Bayley 4 provides laminated Incidental Observation checklist in test kit
- Okay to use during testing or at least familiarize yourself with these items

**Bayley 4**  
Index of Infant and Toddler Development®  
Fourth Edition

**Observation Checklist**

Child's name: \_\_\_\_\_ Date: \_\_\_\_\_  
Examiner's name: \_\_\_\_\_

**Directions:** This checklist may be used to familiarize yourself with those Bayley-4 items that can be scored through incidental observation. The items below are those most likely to be observed either before or during the course of the Bayley-4 testing session (item numbers are consistent with the Bayley-4 Record Form). Items that cannot be scored through incidental observation will be administered to the child.

Item	2-point scoring criteria	Observed
<b>COGNITIVE</b>		
1. Calms When Picked Up	Consistently calms within 30 seconds when picked up and remains calm.	<input type="checkbox"/>
2. Looks at Object	Looks continuously at object for 7 to 10 seconds.	<input type="checkbox"/>
3. Recognizes Caregiver	Expression immediately changes to indicate caregiver recognition on at least 1 occasion.	<input type="checkbox"/>
4. Reaction to Caregiver	Displays a reaction that is clearly anticipatory.	<input type="checkbox"/>
12. Responds to Surroundings	Quiets, looks around, and displays interest in surroundings.	<input type="checkbox"/>
13. Explores Object	Attends to the sight, sound, or feel of rattle by touching, shaking, or engaging in other playful activity.	<input type="checkbox"/>
14. Brings to Mouth	Consistently carries objects to mouth.	<input type="checkbox"/>
15. Inspects Own Hands	Clear and sustained inspection of hands.	<input type="checkbox"/>
17. Reaches/Obtains Objects	Persistently reaches for and obtains object.	<input type="checkbox"/>
19. Bangs Object	Intentional and frequent banging of object.	<input type="checkbox"/>
<b>RECEPTIVE COMMUNICATION</b>		
1. Regards Person Momentarily	Consistently looks at person and sustains look for at least 3 seconds.	<input type="checkbox"/>
2. Calms When Spoken To	Consistently calms and remains calm when spoken to.	<input type="checkbox"/>
3. Reacts to Sounds in Environment	Consistently displays clear reaction to sounds.	<input type="checkbox"/>
4. Recognizes Caregiver	Expression immediately changes to indicate caregiver recognition on at least 1 occasion.	<input type="checkbox"/>
5. Responds to Person's Voice	Consistently displays clear reaction to voice.	<input type="checkbox"/>
6. Reaction to Caregiver	Displays a reaction that is clearly anticipatory.	<input type="checkbox"/>
9. Explores Object	Attends to the sight, sound, or feel of rattle by touching, shaking, or engaging in other playful activity.	<input type="checkbox"/>
10. Brings to Mouth	Consistently carries objects to mouth.	<input type="checkbox"/>
11. Bangs Object	Intentional and frequent banging of object.	<input type="checkbox"/>
12. Responds to Name	Turns head both times name is called and does not respond to unfamiliar name.	<input type="checkbox"/>
<b>EXPRESSIVE COMMUNICATION</b>		
1. Undifferentiated Vocalizations	Produces frequent throaty, grunting, squealing, or gurgling sounds.	<input type="checkbox"/>
2. Social Smile	Produces frequent smiles in response to attention/interaction.	<input type="checkbox"/>
3. Vocalizes Mood	Produces frequent and varied vocalizations that express mood.	<input type="checkbox"/>
4. Social Vocalizing/Laughing	Produces frequent vocalizations and laughter in response to attention/interaction.	<input type="checkbox"/>
5. Vowel Sounds	Produces frequent and varied vocalizations of distinct vowel sounds.	<input type="checkbox"/>
6. Soliloquy/Interaction	Frequent attempts to get attention.	<input type="checkbox"/>
7. Consonant Sounds	Produces frequent and varied vocalizations of distinct consonant sounds.	<input type="checkbox"/>
8. Consonant/Vowel Combination	Produces frequent and varied vocalizations of consonant-vowel combinations.	<input type="checkbox"/>
9. Uses Gestures	Frequent use of gestures to communicate.	<input type="checkbox"/>
10. Jabbars Expressively	Produces frequent vocalizations containing expressive inflections and mimics conversational inflections.	<input type="checkbox"/>
11. Uses 1-Word Approximations	Says frequent and varied one-word (or more) approximations.	<input type="checkbox"/>
12. Directs Attention of Adult to Object	Without being asked, points to or shows at least 1 object.	<input type="checkbox"/>
13. Initiates Word	Says frequent and varied word imitations.	<input type="checkbox"/>
14. Initiates Play	Frequent initiation of play activity.	<input type="checkbox"/>
15. Uses Appropriate Words	Frequent and varied use of words appropriately.	<input type="checkbox"/>
16. Uses Words to Make Wants Known	Says at least 2 words to make wants known.	<input type="checkbox"/>
17. Intelligibility: 50%	Words or phrases are intelligible at least 50% of the time.	<input type="checkbox"/>
18. Combines Gestures and Words	Produces frequent and varied gesture and word combinations.	<input type="checkbox"/>
21. Answers Yes or No	Provides yes or no answer for 4 to 5 questions.	<input type="checkbox"/>
22. Initiates 2-Word Utterances	Frequent and varied initiation of two-word (or more) utterances and each word in the utterance denotes a different concept.	<input type="checkbox"/>
23. Says 2-Word Utterances	Frequent and varied production of two-word (or more) utterances.	<input type="checkbox"/>
24. Intelligibility: 75%	Phrases or sentences are intelligible at least 75% of the time.	<input type="checkbox"/>
25. Says 3-Word Sentences	Frequent and varied production of three-word (or more) sentences.	<input type="checkbox"/>
26. Uses Pronouns	Frequent and varied use of pronouns.	<input type="checkbox"/>
28. Poses Questions	Frequent and varied production of multiple-word questions.	<input type="checkbox"/>
30. Uses Different Word Combinations	Says at least 3 sentence structures.	<input type="checkbox"/>
37. Says 4- or 5-Word Sentences	Says a four- or five-word (or more) sentence at least twice.	<input type="checkbox"/>

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Product Number A1020160058

Item	2-point scoring criteria	Observed
<b>FINE MOTOR</b>		
1. Eyes Follow Moving Person	Eyes track person through midline to the left and to the right.	<input type="checkbox"/>
4. Brings Hand to Mouth	Attempts to place hand in mouth and has consistent success.	<input type="checkbox"/>
8. Keeps Hands Open	Holds both hands open almost all of the time.	<input type="checkbox"/>
10. Distal Rotation	Freely rotates wrist from palm down to palm up.	<input type="checkbox"/>
12. Reaches for Touches Block	Extends 1 or both arms and touches block.	<input type="checkbox"/>
13. Block Grasp Series: Whole Hand	Grasps block using 1 hand with whole hand (palmar) grasp or uses more advanced grasp.	<input type="checkbox"/>
15. Pallet Grasp Series: Whole Hand	Grasps pallet using whole hand grasp or uses more advanced grasp.	<input type="checkbox"/>
16. Transfers Block or Ring	Transfers block (not ring) from hand to hand.	<input type="checkbox"/>
18. Block Grasp Series: Thumb-Finger	Grasps block using thumb-finger grasp.	<input type="checkbox"/>
19. Pallet Grasp Series: Neat Pincer	Grasps pallet using neat pincer grasp.	<input type="checkbox"/>
20. Turns Pages of Book	Consistently and successfully attempts to turn 1 page at a time.	<input type="checkbox"/>
21. Pencil Grasp Series: Palmar	Grasps crayon or pencil using palmar grasp (palmar supinate or radial cross palmar) and makes a mark on paper or uses more advanced grasp.	<input type="checkbox"/>
26. Pencil Grasp Series: Transitional	Consistently grasps crayon or pencil using transitional grasp (digital pronate) and makes a mark on paper or uses more advanced grasp.	<input type="checkbox"/>
29. Pencil Grasp Series: Static Tripod	Consistently grasps crayon or pencil using static tripod grasp or static quadropod grasp and makes a mark on paper or uses more advanced grasp.	<input type="checkbox"/>
45. Pencil Grasp Series: Dynamic	Consistently grasps crayon or pencil using mature, controlled, dynamic grasp and makes a mark on paper.	<input type="checkbox"/>
<b>GROSS MOTOR</b>		
1. Thrusts Arms and Legs	Thrusts arms and legs at least 1 time in a smooth, coordinated fashion.	<input type="checkbox"/>
2. Controls Head Upright Series: 3 Seconds	Holds head erect without support for at least 3 seconds.	<input type="checkbox"/>
3. Turns Head to Each Side	Turns head from 1 side to the other on both sides.	<input type="checkbox"/>
4. Controls Head: Supine Suspension	Maintains head in midline or child lifts head up slightly.	<input type="checkbox"/>
5. Controls Head: Prone Suspension	Maintains head in midline or child lifts head up slightly.	<input type="checkbox"/>
6. Controls Head Upright Series: 15 Seconds	Holds head erect, steady, and without support for at least 15 seconds.	<input type="checkbox"/>
7. Controls Head: Prone Series: 45°	Maintains a raised head at least 45° for at least 3 seconds.	<input type="checkbox"/>
8. Rights Head	Consistently keeps head balanced and in same plane as body; may overcompensate by tilting head toward vertical plane.	<input type="checkbox"/>
10. Rolls: Stomach to Back	Consistently able to roll from stomach to back from either side.	<input type="checkbox"/>
11. Elevates Chest While Prone	Elevates head and chest by pushing up on both hands.	<input type="checkbox"/>
12. ATNR	No spontaneous asymmetric tonic neck posture observed.	<input type="checkbox"/>
13. Supported Sitting Series: 10 Seconds	Sits with slight support for at least 10 seconds.	<input type="checkbox"/>
15. Controls Head: Prone Series: 90°	Maintains a raised head at least 90° for at least 5 seconds; abdomen, hips, and thighs should remain on exam surface.	<input type="checkbox"/>
16. Supported Sitting Series: 30 Seconds	Sits with slight support for at least 30 seconds.	<input type="checkbox"/>
17. Rolls: Back to Side	Consistently able to roll from back to side.	<input type="checkbox"/>
18. Unsupported Sitting Series: 10 Seconds	Sits without support for at least 10 seconds.	<input type="checkbox"/>
20. Shivers: Back Straight	Trunk and head are perpendicular to floor.	<input type="checkbox"/>
22. Grasps Feet	Frequent bringing of 1 or both feet up to hands and grasping a foot or bringing foot to mouth.	<input type="checkbox"/>
23. Rolls: Back to Stomach	Consistently able to roll from back to stomach from either side.	<input type="checkbox"/>
24. Unsupported Sitting Series: 30 Seconds	Sits without support for at least 30 seconds with back straight (i.e., perpendicular to surface).	<input type="checkbox"/>
26. Crawls Series: On Stomach	Crawls forward on stomach (i.e., commands crawl) using both arms for at least 3 ft.	<input type="checkbox"/>
27. Transitions From Sitting to Hands and Knees	Moves from a seated position to hands and knees with good balance.	<input type="checkbox"/>
28. Supports Weight	Supports own weight for at least 4 seconds using your hands for balance only.	<input type="checkbox"/>
29. Crawls Series: Crawl Movement	Crawls forward on hands and knees (or feet) for at least 5 ft.	<input type="checkbox"/>
31. Walks Series: With Support	Rises to a standing position using a chair or other convenient object for support.	<input type="checkbox"/>
32. Walks Sideways With Support (Crutch)	Takes at least 4 steps with support with good coordination.	<input type="checkbox"/>
33. Walks Sideways With Support	Walks sideways at least 2 steps with support.	<input type="checkbox"/>
34. Sits Down With Control	Purposely lowers from a standing to a sitting position in a controlled manner through the entire movement.	<input type="checkbox"/>
35. Stands Alone	Stands alone for at least 5 seconds after hands are released.	<input type="checkbox"/>
36. Walks Down Stairs Series: Both Feet on Each Step Without Support	Rolls to 1 side and stands without using any support.	<input type="checkbox"/>
37. Walks Down Stairs Series: Both Feet on Each Step Without Support	Takes at least 5 steps without support with good coordination and without using arms for balance.	<input type="checkbox"/>
42. Coordinated Run	Smoothly moves from standing to squatting to standing while maintaining balance without using any support.	<input type="checkbox"/>
39. Walks Up Stairs Series: Both Feet on Each Step Without Support	Walks up at least 3 steps without support, placing both feet on each step before stepping up to the next.	<input type="checkbox"/>
41. Walks Down Stairs Series: Both Feet on Each Step Without Support	Walks down at least 3 steps without support, placing both feet on each step before stepping down to the next.	<input type="checkbox"/>
52. Walks Up Stairs Series: Alternating Feet Without Support	Runs with good coordination.	<input type="checkbox"/>
54. Walks Down Stairs Series: Alternating Feet Without Support	Walks up at least 3 steps without support, alternating feet on each step.	<input type="checkbox"/>
56. Walks Down Stairs Series: Alternating Feet Without Support	Walks down at least 3 steps without support, alternating feet on each step.	<input type="checkbox"/>



# III. Sources of Data:

## Standardized Administration of Items



# Standardized Administration of Items

- Must be familiar with Bayley item administration such that you do not need to use manual
- Only brief instructions are in booklet
  - Item description
  - Materials List
  - Timing
  - Brief Scoring Criteria

	Item	Materials	Scoring criteria	Score
 <b>R</b> 17, 23 19, 22	27. Picks Up Another Block	3 blocks	Holds 1 block while reaching for an additional block.	2
			Releases 1 block to pick up an additional block.	1
			Shows no interest in additional block.	0
<b>R</b> 28, 37 30, 42 32, 45	28. Searches for Missing Objects	3 blocks, cup	Comments:	
			Actively searches for blocks in cup.	2
			Glances in cup for blocks.	1
			Shakes and plays with cup but does not search for blocks.	0
			Comments:	
	29. Stirs Spoon	Spoon, cup	Makes stirring motion and imitates readily.	2
			Makes attempt to stir or hits cup with spoon.	1
			Plays with spoon or cup individually but makes no attempt to imitate.	0
			Comments:	
<b>S</b> 30, 45	30. Block Series: 3 Blocks	9 blocks, cup, timer	Places 3 to 9 blocks in cup within 120 seconds.	2
			Places 1 to 2 blocks in cup within 120 seconds.	1
			Does not pick up any blocks or picks up a block but does not put it over or in cup within 120 seconds.	0
			Completion time:	
			Number of blocks:	
			Comments:	
	31. Pushes Car	Car	Intentionally pushes car so that all 4 of its wheels stay on table.	2
			Makes car move but not in manner demonstrated (e.g., sideways, car tips over).	1
			Shows no interest in pushing car or is only interested in details (e.g., wheels).	0
			Comments:	
<b>R</b> 28, 37 30, 42 32, 45	32. Finds Hidden Object	2 cups, 1 block	Finds block by looking first under correct cup on both sides in either trial.	2
			Finds block by looking first under correct cup on only 1 side in either trial.	1
			Does not attempt to find block or is unsuccessful in finding block.	0
			Comments:	
 <b>R</b> 14, 33 22	33. Suspends Ring	Ring with string Note: Ring with string items are also in the Fine Motor subtest.	Obtains ring and suspends it by string without ring touching table.	2
			Obtains ring and suspends it, but ring touches table.	1
			Obtains ring but does not suspend it or only plays with ring or string.	0
			Comments:	

Page 7  
 Total

COGNITIVE Bayley-III

# Standardized Administration of Items

- Things **not** included in booklet (only in manual):
  - Child positioning (supine; seated, etc.)
  - Explicit directions for administration
    - Diagrams of set up of materials
    - Wording/standardized instructions
    - Number of trials
  - Incidental Observation items



# Types of items

- **Demonstration Items** – Examiner demonstrates task (teaching trials)
  - Example – COG obtains duck with pencil; blue puzzle board - first square is demonstrated
- **Sample Items** – Items that require child to respond but examiner must give corrective feedback
  - Example – COG Matches Pictures (airplane)
- **Multiple trial items** – Multiple trials with scoring based on # of correct trials
  - Example – COG Object Permanence items; RL Follows One Part Directions

***It is essential that examiners use demonstration items, sample items, and all trials in order to obtain valid scores***





# SCORING - 2 types: Qualitative vs Quantitative

Mastery (2)▪ Emerging (1)▪ Not present (0)

- **Quantitative Scoring**

- # of trials/objects= point value
- Reliability easier to obtain
- Objective
- Example item 30

- **Qualitative Scoring**

- Requires Clinical Judgment
  - Reliability may be harder
  - Potentially subjective
- Examples items 28, 29

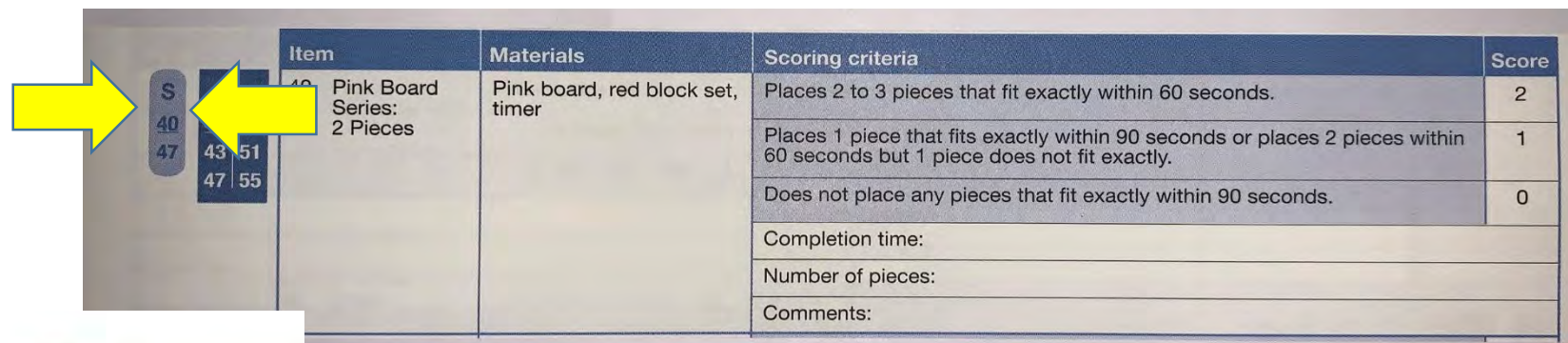
S 30 45	R 28 30 32 37 42 45	28. Searches for Missing Objects	3 blocks, cup	Actively searches for blocks in cup.	2
				Glances in cup for blocks.	1
				Shakes and plays with cup but does not search for blocks.	0
				Comments:	
	29. Stirs Spoon	Spoon, cup	Makes stirring motion and imitates readily.	2	
			Makes attempt to stir or hits cup with spoon.	1	
			Plays with spoon or cup individually but makes no attempt to imitate.	0	
			Comments:		
	R 28 30 32 37 42 45	30. Block Series: 3 Blocks	9 blocks, cup, timer	Places 3 to 9 blocks in cup within 120 seconds.	2
				Places 1 to 2 blocks in cup within 120 seconds.	1
				Does not pick up any blocks or picks up a block but does not put it over or in cup within 120 seconds.	0
				Completion time:	
Number of blocks:					
Comments:					





# Series items

- Items that have the same administration directions
- Items require increasingly difficult passing criteria
- Denoted in booklet in left sidebar in light colored ellipse
- Example:
  - COG 40 Pink Board 2 Pieces (places 1 piece now is 1-point)
  - COG 47 Pink Board 3 Pieces



Item	Materials	Scoring criteria	Score
40 Pink Board Series: 2 Pieces	Pink board, red block set, timer	Places 2 to 3 pieces that fit exactly within 60 seconds.	2
		Places 1 piece that fits exactly within 90 seconds or places 2 pieces within 60 seconds but 1 piece does not fit exactly.	1
		Does not place any pieces that fit exactly within 90 seconds.	0
		Completion time:	
		Number of pieces:	
		Comments:	


# Related Items

- Related items
  - Administer items using same materials in succession
  - Marked on record form in dark colored box labeled with R
  - Usually subsumes Series items
  - Do not administer all items in related item box if beyond ceiling
- Advantages
  - Potential to decrease administration time
  - Efficiency for examiner
- Disadvantages
  - Child frustration/fatigue
  - Examiner differences in use of related item sets



# Related Item sets: Example - blocks and cups

- 28: Searching for Missing Objects
- 30: Block Series: 3 Blocks
- 32: Finds Hidden Object
- 37: Finds Hidden Object - Reversed
- 42: Finds Hidden Object – Visible Displacement
- 45: Block Series: 9 Blocks



<b>R</b> 28   37 30   42 32   45	28. Searches for Missing Objects	3 blocks, cup	Actively searches for blocks in cup.	2
			Glances in cup for blocks.	1
			Shakes and plays with cup but does not search for blocks.	0
			Comments:	



# Related Item set: Example –Puzzles

**40:** Pink Board Series: 2 pieces

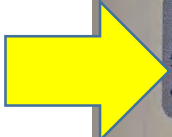
**43:** Blue Board Series: 1 piece

**47:** Pink Board Series: 3 pieces

**49:** Blue Board Series: 4 pieces

**51:** Rotated Pink Board

**55:** Blue Board Series: 9 pieces



		Item	Materials	Scoring criteria	Score
S	R	40. Pink Board Series: 2 Pieces	Pink board, red block set, timer	Places 2 to 3 pieces that fit exactly within 60 seconds.	2
40	40 49			Places 1 piece that fits exactly within 90 seconds or places 2 pieces within 60 seconds but 1 piece does not fit exactly.	1
47	43 51			Does not place any pieces that fit exactly within 90 seconds.	0
	47 55			Completion time:	
				Number of pieces:	
				Comments:	



# Related Item Sets

“Use clinical judgement and take into consideration personal test administration style to modify or create additional [related] groups based on child’s age and his or her behavior during testing *to keep the child engaged and to shorten test duration time.*” (Manual, page 19)

***Related items sets were NOT used in standardization trials.  
Added later to speed administration.***

**Therefore:**

- ***Use judiciously; only if really necessary***
- ***Consider child frustration/capabilities***

**Comments or Questions??**





# Scoring the Bayley-4

**NIH**  
**HEAL**  
**INITIATIVE**

NIH  
NEONATAL RESEARCH NETWORK

 **IDeA States Pediatric Network**  
ECHO • A program supported by the NIH



# Scoring Subtests

- Total all scores across all items administered
- ESSENTIAL= Count all items below the ceiling as 2-points
  - It is assumed child can pass all previous items

Item	Materials	Scoring criteria	Score
27. Pick Up Another Block	3 blocks	Holds 1 block while reaching for an additional block. Releases 1 block to pick up an additional block. Shows no interest in additional block.	2 1 0
28. Searches for Missing Objects	3 blocks, cup	Actively searches for blocks in cup. Glances in cup for blocks. Shakes and plays with cup but does not search for blocks.	2 1 0
29. Stir Spoon	Spoon, cup	Makes stirring motion and imitates readily. Makes attempt to stir or hit his/her with spoon. Plays with spoon or cup individually but makes no attempt to imitate.	2 1 0
30. Block Series: 3 Blocks	9 blocks, cup, timer	Places 3 to 9 blocks in cup within 120 seconds. Places 1 to 2 blocks in cup within 120 seconds. Does not pick up any blocks or picks up a block but does not put it over or in cup within 120 seconds. Completion time: Number of blocks: Comments:	2 1 0
31. Pushes Car	Car	Intentionally pushes car so that all 4 of its wheels stay on table. Makes car move but not in manner demonstrated (e.g., sideways, car tips over). Shows no interest in pushing car or is only interested in details (e.g., wheels).	2 1 0
32. Finds Hidden Object	2 cups, 1 block	Finds block by looking first under correct cup on both sides in either trial. Finds block by looking first under correct cup on only 1 side in either trial. Does not attempt to find block or is unsuccessful in finding block.	2 1 0
33. Suspends Ring	Ring with string Note: Ring with string items are also in the Fine Motor subtest.	Obtains ring and suspends it by string without ring touching table. Obtains ring and suspends it, but ring touches table. Obtains ring but does not suspend it or only plays with ring on surface.	2 1 0
Page 7 Total			64

Item	Materials	Scoring criteria	Score
34. Removes Pellet	Food pellet, bottle	Purposefully removes pellet from bottle using some form of directed effort. Shakes bottle and pellet comes out accidentally. Shows no interest in pellet or shows interest but does not remove pellet.	2 1 0
35. Clear Box	Clear box, small ball, timer	Retrieves ball through open end of box within 1 to 20 seconds. Retrieves ball through open end of box within 21 to 45 seconds. Does not retrieve ball within 45 seconds. Completion time: Comments:	2 1 0
36. Squeezes Object	Squeeze toy	Intentionally squeezes toy, irritating examiner. Attempts to make toy squeak by banging toy on a surface. Does not attempt to make toy squeak.	2 1 0
37. Finds Hidden Object (Reversed)	2 cups, 1 block	Finds block by first looking under correct cup for 4 trials. Finds block by first looking under correct cup for 2 to 3 trials. Finds block by first looking under correct cup for 0 to 1 trials. Comments:	2 1 0
38. Pegboard Series: 2 Pegs	Pegboard, 6 yellow pegs, timer	Places at least 2 pegs in 2 different holes within 70 seconds. Places only 1 peg in hole within 70 seconds or places same peg in 2 different holes within 70 seconds. Does not place any pegs in a hole within 70 seconds. Completion time: Number of pegs: Comments:	2 1 0
39. Rational Play: Self	None	Caregiver provides at least 3 examples. Caregiver provides 1 to 2 examples. Caregiver provides 0 examples. Comments: <i>drinks phone to ear, hugs baby</i>	2 1 0
Page 8 Total			10

Item	Materials	Scoring criteria	Score
40. Pink Board Series: 2 Pieces	Pink board, red block set, timer	Places 2 to 3 pieces that fit exactly within 60 seconds. Places 1 piece that fits exactly within 60 seconds or places 2 pieces within 60 seconds but 1 piece does not fit exactly. Does not place any pieces that fit exactly within 60 seconds. Completion time: Number of pieces: Comments:	2 1 0
41. Listens to Story	Storybook	Attends to story the entire time with only brief lapses in attention. (Almost every time) Attends to story for only a short time. (Some of the time) Shows no interest in book or does not attend to story. (None of the time) Comments:	2 1 0
Caregiver Question: When you read to [insert child's name], does (he/she) pay attention to the entire story almost every time, some of the time, or none of the time?			
42. Finds Hidden Object (Mobile Displacement)	2 cups, 1 block	Provides correct response for 2 trials. Provides correct response for 1 trial. Provides correct response for 0 trials. Comments:	2 1 0
43. Blue Board Series: 1 Piece	Blue board, blue block set, timer	Places 1 to 9 pieces that fit exactly within 90 seconds. Places at least 1 piece within 90 seconds but piece does not fit exactly. Does not place any pieces that fit exactly within 90 seconds. Completion time: Number of pieces: Comments:	2 1 0
44. Relational Play: Others	Doll, cup, spoon, small ball, comb, tissue	Uses at least 2 objects with doll or caregiver. Uses only 1 object with doll or caregiver. Uses 0 objects with doll or caregiver. Comments:	2 1 0
45. Block Series: 9 Blocks	9 blocks, cup, timer	Places 9 blocks in cup within 120 seconds. Places 5 to 8 blocks in cup within 120 seconds. Does not place at least 5 blocks in cup within 120 seconds. Completion time: Number of blocks: Comments:	2 1 0
Page 9 Total			12

Item	Materials	Scoring criteria	Score
46. Pegboard Series: 6 Pegs	Pegboard, 6 yellow pegs, timer	Places all 6 pegs within 1 to 35 seconds. Places all 6 pegs within 36 to 90 seconds. Does not place all 6 pegs within 90 seconds. Completion time: Number of pegs: Comments:	2 1 0
47. Pink Board Series: 3 Pieces	Pink board, red block set, timer	Places 3 pieces that fit exactly within 1 to 60 seconds. Places 3 pieces that fit exactly within 61 to 90 seconds. Does not place 3 pieces that fit exactly within 90 seconds. Completion time: Number of pieces: Comments:	2 1 0
48. Uses Pencil to Obtain Object	Pencil, small duck	Makes at least 1 sweeping motion with pencil and obtains duck. Makes at least 1 sweeping motion with pencil but does not obtain duck. Hits or pushes duck with pencil, using random swings of pencil, without attempting to pull duck toward him or her.	2 1 0
49. Blue Board Series: 4 Pieces	Blue board, blue block set, timer	Places 4 to 9 pieces that fit exactly within 90 seconds. Places 3 pieces that fit exactly within 90 seconds. Does not place at least 3 pieces that fit exactly within 90 seconds. Completion time: Number of pieces: Comments:	2 1 0
50. Representational Play	None	Caregiver provides at least 2 examples. Caregiver provides 1 example. Caregiver provides 0 examples. Comments:	2 1 0
Caregiver Question: When playing, does [insert child's name] make-believe an object is something else, like pretending a ball is a piece of fruit?			
If the caregiver says yes, ask: Can you give me some examples of other ways that (he/she) make-believe an object is something else?			
51. Rotated Pink Board	Pink board, red block set, timer	Places 3 pieces that fit exactly within 60 seconds. Places 2 pieces that fit exactly within 60 seconds. Does not place at least 2 pieces that fit exactly within 60 seconds. Completion time: Number of pieces: Comments:	2 1 0
Page 10 Total			2

Subtest Total = 90

# Steps for Deriving Subtest and Composite Scores

1. Total each subtest to get raw scores
2. Record subtest raw score front of booklet – top table
3. Look up Scaled Scores in Table A.1
4. Sum scaled scores RC + EL and FM + GM
5. Record Sum of Scaled Score in bottom table
6. Look up Standard Scores in Table A.4

**BAYLEY 4**  
Scales of Infant and Toddler Development™  
Fourth Edition

**Record Form**

Child's name: CHILD  
Sex: ☐ M ☐ F  
Examiner's name: KEG  
Reason for referral: ECHO ACTNOW

**Calculation of Child's Age**

	Year	Month	Day
Test date	2022	01	20
Birth date	2019	12	19
Test age	2	1	01
Test age in months and days	Years x 12	Months	Total months Days
	24	1	= 25 01

**Adjustment for Prematurity**

	Year	Month	Day
Test date			
Expected birth date			
Adjusted test age			
Adjusted test age in months and days	Years x 12	Months	Total months Days

**Start Points**

Test age/adjusted test age	Start point
0 months 16 days – 1 month 30 days	A
2 months 0 days – 2 months 30 days	B
3 months 0 days – 3 months 30 days	C
4 months 0 days – 4 months 30 days	D
5 months 0 days – 5 months 30 days	E
6 months 0 days – 6 months 30 days	F
7 months 0 days – 7 months 30 days	G
8 months 0 days – 10 months 30 days	H
11 months 0 days – 13 months 30 days	I
14 months 0 days – 16 months 30 days	J
17 months 0 days – 19 months 30 days	K
20 months 0 days – 22 months 30 days	L
23 months 0 days – 25 months 30 days	M
26 months 0 days – 28 months 30 days	N
29 months 0 days – 32 months 30 days	O
33 months 0 days – 38 months 30 days	P
39 months 0 days – 42 months 30 days	Q

**Summary**  
Total Raw Score to Scaled Score Conversion

Subtest	Raw score	Scaled score (Table A.1)	Age equivalent (Table B.1)	Growth scale value (Table B.2)
Cognitive (CG)	90	6		
Receptive Communication (RC)	42	7		
Expressive Communication (EC)	42	8		
Sum of scaled scores (Language (LANG))		15		
Fine Motor (FM)	57	9		
Gross Motor (GM)	98	11		
Sum of scaled scores (MOT)		20		

**Sum of Scaled Scores to Standard Score Conversion**

Scale	Sum of scaled scores	Standard score (Table A.4)	Percentile rank	Confidence interval (%)
COG	6	80	9 <sup>th</sup>	-
LANG	15	86	18 <sup>th</sup>	-
MOT	20	101	53 <sup>rd</sup>	-

**Social-Emotional and Adaptive Behavior Raw and Scaled Scores**

Subtest/subdomain	SE	REC	EXP	PER	IPR	PLA
Raw score						
Scaled score						

**NIH HEAL INITIATIVE**  
NICHD NEONATAL RESEARCH NETWORK  
IDeA States Pediatric Network  
ECHO A program supported by the NIH

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# Deriving Subtest and Composite Scores

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**Table A.1** Scaled Score Norms for the Cognitive, Language, and Motor Scales (continued)

Scaled score	Ages 22:16-23:15					Scaled score	Ages 23:16-24:15		
	CG	RC	EC	FM	GM		CG	RC	EC
1	0-72	0-27	0-17	0-36	0-64	1	0-73	0-28	0-18
2	73-75	28-29	18-19	37-38	65-67	2	74-76	29-30	19-20
3	76-78	30-31	20-23	39-40	68-71	3	77-79	31-32	21-24
4	79-82	32-33	24-27	41-43	72-75	4	80-83	33-34	25-28
5	83-85	34-35	28-30	44-47	76-79	5	84-86	35-36	29-31
6	86-89	36-38	31-33	48-50	80-82	6	87-90	37-39	32-35
7	90-93	39-41	34-37	51-52	83-85	7	91-94	40-42	36-39
8	94-97	42-43	38-41	53-54	86-88	8	95-98	43-45	40-43
9	98-101	44-46	42-45	55-56	89-91	9	99-103	46-48	44-47
10	102-106	47-50	46-48	57-59	92-94	10	104-109	49-52	48-50
11	107-112	51-54	49-51	60-62	95-97	11	110-115	53-56	51-53
12	113-119	55-59	52-54	63-65	98-100	12	116-121	57-60	54-56
13	120-126	60-64	55-56	66-69	101-103	13	122-128	61-65	57-58
14	127-136	65-70	57-60	70-74	104-106	14	129-138	66-71	59-62
15	137-145	71-75	61-64	75-79	107-109	15	139-147	72-76	63-66
16	146-152	76-80	65-68	80-85	110-111	16	148-154	77-81	67-70
17	153-159	81-84	69-72	86-90	112-113	17	155-160	82-84	71-73
18	160-162	—	73-74	91	114-115	18	161-162	—	74
19	—	—	—	92	116	19	—	—	—

Scaled score	Ages 24:16-25:15					Scaled score	Ages 25:16-26:15		
	CG	RC	EC	FM	GM		CG	RC	EC
1	0-75	0-29	0-18	0-38	0-66	1	0-76	0-30	0-19
2	76-78	30-31	19-21	39-40	67-69	2	77-79	31-32	20-22
3	79-81	32-33	22-25	41-42	70-73	3	80-82	33-34	23-26
4	82-85	34-35	26-29	43-45	74-77	4	83-86	35-37	27-30
5	86-89	36-38	30-33	46-49	78-81	5	87-90	38-40	31-34
6	90-92	39-41	34-37	50-52	82-84	6	91-94	41-43	35-38
7	93-95	42-44	38-41	53-54	85-87	7	95-99	44-46	39-42
8	96-101	45-47	42-45	55-56	88-91	8	100-104	47-49	43-46
9	102-106	48-50	46-49	57-58	92-94	9	105-109	50-52	47-50
10	107-112	51-54	50-52	59-61	95-97	10	110-114	53-56	51-54
11	113-117	55-57	53-55	62-64	98-100	11	115-120	57-59	55-57
12	118-123	58-61	56-58	65-67	101-103	12	121-126	60-63	58-60
13	124-130	62-66	59-60	68-71	104-106	13	127-133	64-68	61-62
14	131-140	67-72	61-64	72-76	107-108	14	134-142	69-73	63-66
15	141-149	73-77	65-68	77-81	109-111	15	143-151	74-78	67-70
16	150-155	78-82	69-72	82-87	112-113	16	152-156	79-82	71-73
17	156-160	83-84	73-74	88-90	114-115	17	157-160	83-84	74
18	161-162	—	—	91	116	18	161-162	—	—
19	—	—	—	92	—	19	—	—	—

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Scales of Infant and Toddler Development™  
Fourth Edition

Record Form

Child's name: CHILD  
Sex: ☐ M ☐ F  
Examiner's name: KEG  
Reason for referral: ECHO ACTNOW

**Calculation of Child's Age**

Test date: Year 2022 Month 01 Day 20  
Birth date: Year 2019 Month 12 Day 19  
Test age: Year 2 Month 1 Day 01  
Test age in months and days: Years x 12 = 24 Months + 1 = 25 Total months Days 01

**Adjustment for Prematurity**

Test date: Year Month Day  
Expected birth date: Year Month Day  
Adjusted test age: Years x 12 = Months Total months Days

**Start Points**

Test age/adjusted test age: 0 months 16 days = 1 month 30 days **A**  
2 months 0 days = 2 months 30 days **B**  
3 months 0 days = 3 months 30 days **C**  
4 months 0 days = 4 months 30 days **D**  
5 months 0 days = 5 months 30 days **E**  
6 months 0 days = 6 months 30 days **F**  
7 months 0 days = 7 months 30 days **G**  
8 months 0 days = 8 months 30 days **H**  
11 months 0 days = 13 months 30 days **I**  
14 months 0 days = 16 months 30 days **K**  
17 months 0 days = 19 months 30 days **L**  
20 months 0 days = 22 months 30 days **M**  
23 months 0 days = 25 months 30 days **N**  
26 months 0 days = 28 months 30 days **O**  
29 months 0 days = 32 months 30 days **P**  
33 months 0 days = 38 months 30 days **Q**  
39 months 0 days = 42 months 30 days

**Summary**  
Total Raw Score to Scaled Score Conversion

Subtest	Scaled score (Table A.1)	Age equivalent (Table B.1)	Growth scale value (Table B.2)
Cognitive (COG)	<u>90</u>	<u>6</u>	<u>1</u>
Receptive Communication (RC)	<u>42</u>	<u>7</u>	
Expressive Communication (EC)	<u>42</u>	<u>8</u>	
Sum of scaled scores	<u>15</u>	<u>2</u>	
Fine Motor (FM)	<u>57</u>	<u>9</u>	
Gross Motor (GM)	<u>98</u>	<u>11</u>	
Sum of scaled scores	<u>20</u>	<u>3</u>	

**Sum of Scaled Scores to Standard Score Conversion**

Scale	Sum of scaled scores	Standard score (Table A.4)	Percentile rank	Confidence interval (%)
COG	<u>6</u>	<u>80</u>	<u>9<sup>th</sup></u>	-
LANG	<u>15</u>	<u>86</u>	<u>18<sup>th</sup></u>	-
MOT	<u>20</u>	<u>101</u>	<u>53<sup>rd</sup></u>	-

**Social-Emotional and Adaptive Behavior Raw and Scaled Scores**

Subtest/subdomain	SE	REC	EXP	PER	IPR	PLA
Raw score						
Scaled score						

**Table A.4** Standard Score Norms for the Cognitive, Language, Motor, and Social-Emotional Scales

Standard score	PR	Sum of scaled scores				Standard score	PR	Sum of scaled scores					
		COG	LANG	MOT	SOEM			COG	LANG	MOT	SOEM		
												1	2
45	<0.1	—	2	2	—	103	58	—	21	21	—		
46	<0.1	—	—	—	—	104	61	—	—	—	—		
47	<0.1	—	—	—	—	105	63	11	22	—	11		
48	<0.1	—	—	—	—	106	66	—	—	22	—		
49	<0.1	—	—	—	—	107	68	—	—	—	—		
50	<0.1	—	—	3	—	108	70	—	23	—	—		
51	0.1	—	3	—	—	109	73	—	—	23	—		
52	0.1	—	—	—	—	110	75	12	—	—	12		
53	0.1	—	—	—	—	111	77	—	24	—	—		
54	0.1	—	—	4	—	112	79	—	—	24	—		
55	0.1	1	—	—	1	113	81	—	—	—	—		
56	0.2	—	4	—	—	114	82	—	25	25	—		
57	0.2	—	—	—	—	115	84	13	—	—	13		
58	0.3	—	—	5	—	116	86	—	—	26	—		
59	0.3	—	—	—	—	117	87	—	26	27	—		
60	0.4	2	5	—	2	118	88	—	—	—	—		
61	0.5	—	—	6	—	119	90	—	—	28	—		
62	1	—	—	—	—	120	91	14	27	—	14		
63	1	—	6	—	—	121	92	—	—	—	—		
64	1	—	7	—	—	122	93	—	28	29	—		
65	1	3	—	—	3	123	94	—	—	—	—		
66	1	—	7	8	—	124	95	—	29	—	—		
67	1	—	—	—	—	125	95	15	—	—	15		
68	2	—	8	—	—	126	96	—	30	30	—		
69	2	—	—	9	—	127	96	—	—	—	—		
70	2	4	9	—	4	128	97	—	31	—	—		
71	3	—	—	—	—	129	97	—	—	31	—		
72	3	—	10	10	—	130	98	16	32	—	16		
73	4	—	—	—	—	131	98	—	—	—	—		
74	4	—	—	11	—	132	98	—	—	32	—		
75	5	5	11	—	5	133	99	—	33	—	—		
76	5	—	—	—	—	134	99	—	—	—	—		
77	6	—	12	12	—	135	99	17	—	—	17		
78	7	—	—	—	—	136	99	—	34	33	—		
		80	9	6	—	137	99	—	—	—	—		
		—	—	—	6	138	99	—	—	—	—		
		—	—	—	—	139	99.5	—	—	—	—		
82	12	—	—	14	—	140	99.6	18	35	34	18		
83	13	—	14	—	—	141	99.7	—	—	—	—		
84	14	—	—	15	—	142	99.7	—	—	—	—		
85	16	7	—	—	7	143	99.8	—	—	35	—		
86	18	—	15	—	—	144	99.8	—	36	—	—		
87	19	—	16	—	—	145	99.9	19	—	—	19		
88	21	—	—	—	—	146	99.9	—	—	—	—		
89	23	—	16	—	—	147	99.9	—	—	36	—		
90	25	8	—	8	—	148	99.9	—	—	—	—		
91	27	—	17	—	—	149	99.9	—	37	—	—		
92	30	—	17	—	—	150	>99.9	—	—	—	—		
93	32	—	—	—	—	151	>99.9	—	—	37	—		
94	34	—	—	—	—	152	>99.9	—	—	—	—		
95	37	9	18	18	9	153	>99.9	—	—	—	—		
96	39	—	—	—	—	154	>99.9	—	—	—	—		
97	42	—	—	—	—	155	>99.9	—	38	38	—		
98	45	—	19	19	—	90% confidence level = +/-				6	6	6	2
99	47	—	—	—	—	95% confidence level = +/-				7	7	7	2
100	50	10	20	—	10								
101	53	—	—	20	—								
102	55	—	—	—	—								

Bayley-4 ■ Appendix A: Norms and Conversion

# Learning to Administer a Reliable and Standardized Bayley - 4

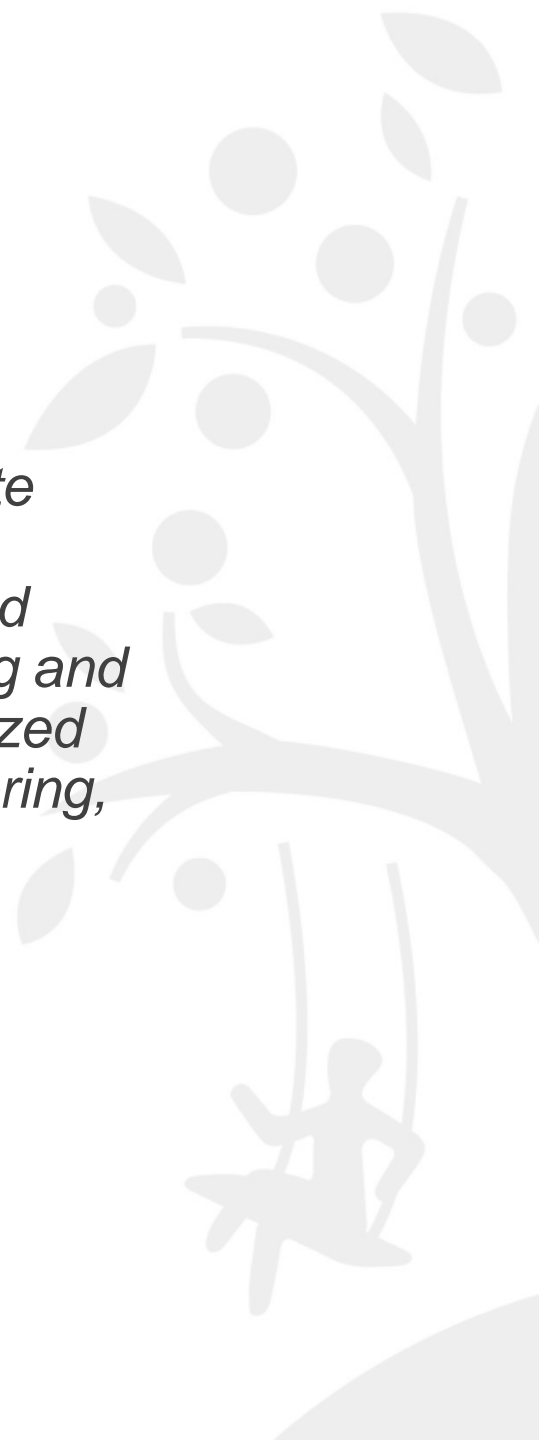


# Examiner qualifications

- Manual states:

*“The Bayley 4 should only be administered by examiners with graduate level or professional training and experience in the administration and interpretation of standardized clinical instruments. Such training should consist of an overview of assessment principles, including establishing and maintaining rapport, eliciting optimal performance, following standardized administration procedures, understanding psychometric statistics, scoring, and interpreting tests, and maintaining test security.”*

- Complex test administration and interpretation





# Examiner Qualifications

- Examiners need experience with:
  - Assessment of young children
  - Establishing and maintaining rapport
  - Managing behavior in structured assessment setting
  - Strategies for eliciting optimal performance
  - Understanding of psychometric statistics, scoring and interpretation of standardized assessment
  - ***Understanding of the crucial importance of following standardized administration procedures***



# Administering a reliable Bayley-4 for Research

- The Bayley -4 is a standardized test
  - Norms were established based on **uniform testing conditions**; standard administration and scoring procedures were used
- For the normative data to be utilized to obtain scores, the Bayley-4 administration **MUST** conform to same *uniform testing conditions*.
  - (e.g. administered according to the procedures in Chapter 4)
- Deviations from standard procedures, such as changes in the phrasing or presentation of item, will reduce the reliability and validity of results and raw scores would not be interpretable using nationally derived norms.



# Administering a Reliable Bayley

- This does not mean that the Bayley must be administered in a rigid or unnatural manner.
- These are children and we are people, not robots, so try to adhere to standard procedures while maintaining a warm and engaging interaction style with the child.



# Reliability

- No more than 1-2 omitted items per subscale (and preferably **none**)
- Research reliability set at .85 *per subscale* and includes calculation of accuracy of scoring and administration
  - Inter-rater reliability calculated on **scoring**
    - Scoring 0, 1, 2
  - Reliability also calculated based on adherence to **standardized administration** of tasks
    - How much error is a problem?
      - Major errors versus minor errors
      - Major error defined as error that fundamentally changes the nature of task or difficulty level – “spoiled item”
      - Examples – puzzles; pretend play



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NEONATAL RESEARCH NETWORK

IDEA States Pediatric Network  
ECHO + A program supported by the NIH

# Administering a Reliable Bayley-4: Child Factors

- Standardized testing reflects a child's performance *under a standardized set of conditions using a standardized set of toys*
- Children **will not** necessarily demonstrate their *absolute peak performance on all tasks administered*
- Effort, attention, and persistence may vary across test
- Ideally, child will attend well and put forth good effort but slight variability in these factors is *normal and expected*
- *This was also true of children in standardization sample, so is accounted for in norms and scoring*



# Strategies for increasing child compliance

- Build rapport first (play social game, use a few non-Bayley toys)
- Be enthusiastic, positive, relaxed and playful
- Adapt your style to match child's temperament/disposition
  - Tone, volume of voice to child's needs
- Praise child for efforts, not accuracy
- Take breaks as needed; allow child to get up and move around; use snacks
- Relocate to floor, different table, etc. if child gets antsy
- Intersperse more enjoyable subtests (e.g. FM) between difficult subtests (RL and EL)
- Never leave child without a toy- swap for next toy, let child hold a toy while scoring





# Be Willing to Accept Incorrect Response/Child Failure

**We all want children to do well but.....**

- Resist temptation to
  - Give child clues to correct answers or cue responses in manner not listed in manual
  - Help them in any way not listed in manual
  - Repeatedly present item- can be counter-productive if child tunes you out
    - *Get the child's attention first; present the directions no more than once or twice*
- Be willing to accept incorrect responses/failures
  - Failure is **not** a reason to repeat task – only give number of trials specified
  - Get child's attention first so do not need to repeat
  - If item done correctly with child who is attending – must count failures as failures
- Behavioral compliance declining? May be approaching or at ceiling level of performance
  - Especially true when getting to typical ceiling for children of that age
  - Behavioral resistance may reflect a true failure with a task that is too difficult.



# Administering an Efficient Bayley

- Time is crucial – this is a lengthy assessment for a toddler
- Become as familiar as possible with test so you can attend to child, not the booklet
- Only administer necessary items – try not to go past 5 failed items (ceiling)
- **For items with multiple trials, once you have met highest criteria for 2-point score, okay to discontinue**
  - Example – Expressive Language Item 20

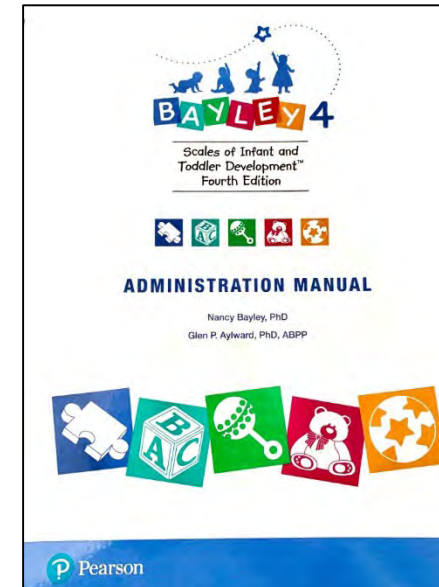
20. Names Picture	Stimulus Book	Provides correct response for 5 to 12 trials.	2
		Provides correct response for 1 to 4 trials.	1
		Provides correct response for 0 trials.	0
		<b>Correct?</b>	
		Trial 1 <input type="checkbox"/> Cookie   Trial 4 <input type="checkbox"/> Bottle   Trial 7 <input type="checkbox"/> Shoe(s)   Trial 10 <input type="checkbox"/> Car Trial 2 <input type="checkbox"/> Bird   Trial 5 <input type="checkbox"/> Balloon(s)   Trial 8 <input type="checkbox"/> Bed   Trial 11 <input type="checkbox"/> Kitten Trial 3 <input type="checkbox"/> Ball   Trial 6 <input type="checkbox"/> Spoon   Trial 9 <input type="checkbox"/> Apple   Trial 12 <input type="checkbox"/> Book	
Comments:			

# Strategies for Learning the Bayley 4



# Strategies for Learning

- Attend Training or Review Video of training
- Review Manual
  - Read Chapter 3: General Administration and Scoring Guidelines for the Cognitive, Language, and Motor Scales
  - Read and review Chapter 4: Administration and Scoring for the Cognitive, Language, and Motor Scales
- Get familiar with toys and materials in kit; sort through and examine
- Watch Administration video by Vicki Watson, Gold Standard Examiner
- Review GS consensus document provided



# Strategies for Learning: Make a template

- Make a Bayley Administration Booklet Template for administration until you are **very** familiar with items.
  - Write out oral instructions
  - Describe/Draw material placement
  - Score in pencil and transfer to fresh booklet
  - Erase and re-use original template booklet
  - Use plastic sleeve covers and dry erase

Item	Materials	Directions/Notes	Scoring criteria	Score
27. Picks Up Another Block	3 blocks	Place 1, after child picks up, place 2nd	Holds 1 block while reaching for an additional block. Releases 1 block to pick up an additional block. Shows no interest in additional block.	2 1 0
28. Searches for Missing Objects	3 blocks, cup 2 shades	Only maintaining 1st 2nd is nice	Actively searches for blocks in cup. Glances in cup for blocks. Shakes and plays with cup but does not search for blocks.	2 1 0
29. Stirs Spoon	Spoon, cup	Look at me. You do it. Done stirring	Makes stirring motion and imitates readily. Makes attempt to stir or hit cup with spoon. Plays with spoon or cup individually but makes no attempt to imitate.	2 1 0
30. Block Series: 3 Blocks	3 blocks, cup, timer	Put 3 blocks in cup 1 at a time - 1 at a time and behind wheel 6 blocks out of sight	Places 3 to 8 blocks in cup within 120 seconds. Places 1 to 2 blocks in cup within 120 seconds. Does not pick up any blocks or picks up a block but does not put it over or in cup within 120 seconds. Completion time: Number of blocks:	2 1 0
31. Pushes Car	Car	Zoom Slowly push car across table	Intentionally pushes car so that all 4 of its wheels stay on table. Makes car move but not in manner demonstrated (e.g., sideways, car tips over). Shows no interest in pushing car or is only interested in details (e.g., wheels).	2 1 0
32. Finds Hidden Object	2 cups, 1 block	Use the block? I am going to hide it! Look! I'm hiding it under here. Where is it?	Finds block by looking first under correct cup on both sides in either trial. Finds block by looking first under correct cup on only 1 side in either trial. Does not attempt to find block or is unsuccessful in finding block.	2 1 0
33. Suspends Ring	Ring with string	Note: Ring with string items are also in the Fine Motor subtest. 8-12 inches from child - dangle	Obtains ring and suspends it by string without ring touching table. Obtains ring and suspends it, but ring touches table. Obtains ring but does not suspend it or only plays with ring or string.	2 1 0

Page 7 Total



B	R	
33	40	49
39	43	51
50	47	55

B	R	
33	40	49
39	43	51
50	47	55

Page 18  
Total

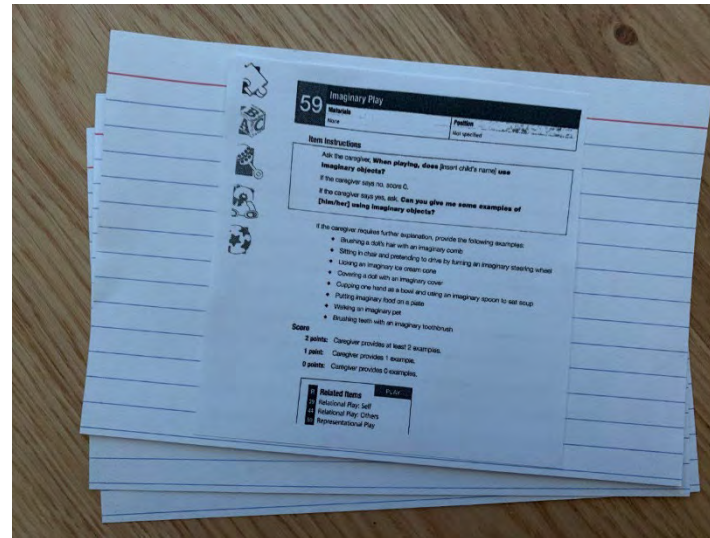
Often / Almost Every time :  $\geq 75\%$  of the time  
Not often / Some of the time :  $< 75\%$  of the time

Page 9  
Total



# Strategies for Learning: Make a series of administration index cards

- Can use index cards for caregiver questions and cues or other complex items
- But...some examiners put entire test on index cards; one card per item and flip through as they go
- I find this cumbersome, but some examiners like it



# Practice, practice, practice.....and practice

- Bayley harder to get to point of reliability than most standardized tests
  - Rapid developmental skill attainment in short time (birth to 42 months)
  - Despite item overlap, each age level can be almost like a new test
- Role play with colleague, family member, older child
- Video your administration and then watch your video
  - Compare each item to manual; look for mistakes; write them down
- Observe colleague's administration
  - Look at manual to find mistakes; discuss errors or points of disagreement
- Examiner drift is common
  - Refer back to manual prior to and after every assessment to review your administration and scoring
  - Video your administration yearly



# Next Steps: Obtaining Bayley-4 Certification



# Bayley-4 Examiner Next Steps

- Next week: January 28<sup>th</sup> In-depth Training
  - Cognitive scale
  - Language – Receptive and Expressive scales
  - Motor – Fine and Gross Motor
- Video Certification Submissions include:
  - Copy of de-identified test booklet with scoring
  - Self-Critique form and narrative identifying all errors
    - MUST watch your own video and compare to manual prior to submission
    - Describe your errors and any reasons/challenges
  - Videos of all subtests
    - Either in one video
    - Or clearly labeled if separate videos –
      - No more than 5 segments (one for each subsection)
- Box Folder
  - Training recordings
  - Video of administration
  - Gold Standard Consensus Document

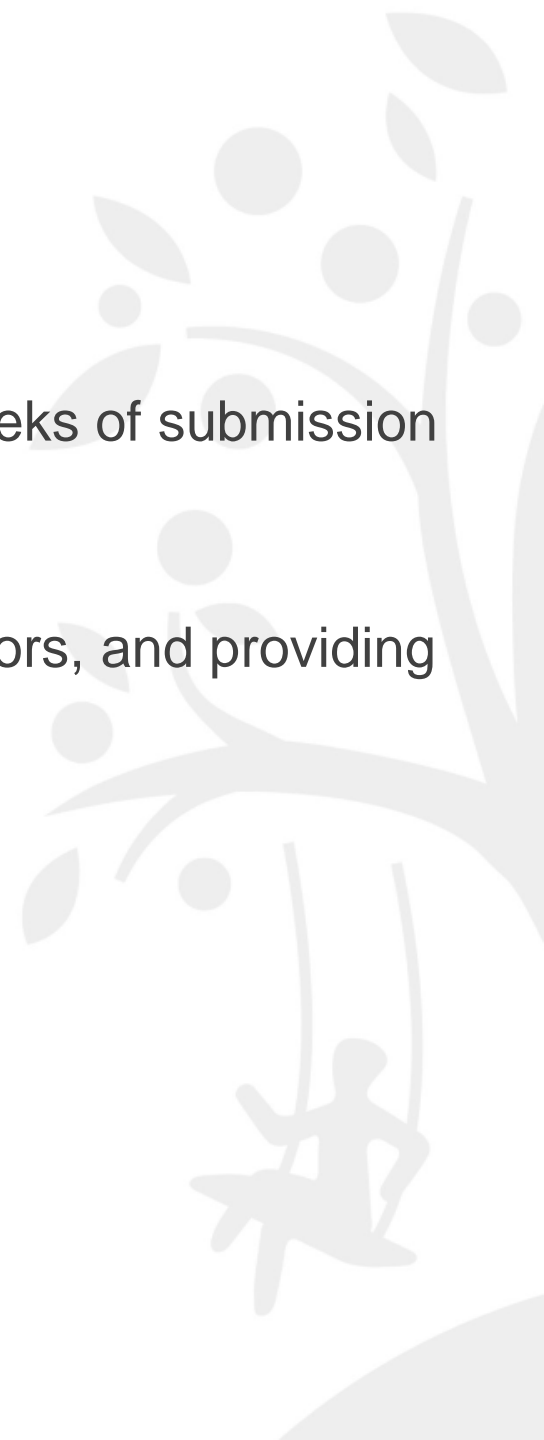


**Video of administration will be due at least 2 months prior to first child entering the test window;  
allows for second submission if needed**

**If site has two examiners, please try to spread out video submissions by at least a few weeks**

# Gold Standard Examiner Responsibilities

- We will review your videos, self-critiques, and scoring booklet within +/-3 weeks of submission
  - Ideally sooner, but depends on number of videos submitted in a give week
- Calculate examiner reliability for administration and scoring
- Email examiner a feedback letter identifying strengths, weaknesses, and errors, and providing tips and strategies for improving administration



# Contact Us – We welcome your questions!

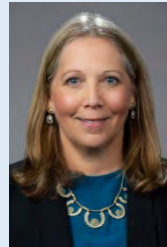
## Gold Standard Examiners

We have served as trainers, GS examiners, and consultants for many clinical trials and multi-site studies for the past 15+ years

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### RTI sites:

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# Questions/Comments?

