

Learning Progression: Number Sense

Ways to Support Number Sense: Play early number activities using counters, blocks, or small toys; Play Deal and Copy games using cards and counters; Play Memory Match games; Play Build and Compare games using linking cubes; Play Number Board Bingo using pictures, numbers, even tally marks; Ask questions and use math language as children count and compare objects; Engage children in discussion about mathematics; Provide mathematically rich environment where children can explore math and play with numbers; Play Step Number Line or Run The Numbers when outside on the playground; Integrate math in activities and stations/centers around the room

Data-Driven Decision Making Directions:

1. **Gather** information by observing and interacting with the child as it relates to *number sense*.
 - Gather information across at least three different sessions. A session can be a particular situation (e.g., counting how many straws are needed at snack time), location (e.g., playground), and/or activity (e.g., reading *Underwater Counting*).
 - Information should be gathered during incidental learning opportunities and play as well as during intentional or more explicit teaching events.
 - Talk with family members and/or other caregivers about ways the child demonstrates *number sense* at home or in the community.
2. **Document** a child's *number sense* skills, knowledge or behaviors on the recording form.
 - Record a brief description of the session, including the date and activity name, situation, and/or location of the observation/interaction.
 - Identify all of the number sense skills, knowledge, and behaviors you observe while interacting with or observing the child. For each session fill in the blanks with quantities demonstrated by the child.
 - Keep notes about what you see the child do/hear the child say that is related to number sense.
 - For additional information, see Key Terms and Additional Supports.
3. **Summarize** the information numerically by reviewing the data on the recording form.
 - Sum the total number of number sense skills, knowledge, and behaviors the child demonstrated across all sessions. Another numerical summary idea is to list the highest number a child counted to, matched, named, etc.
 - For additional information, see Key Terms and Additional Supports.
4. **Analyze** the information on the recording form and any additional information you may have gathered from other sources such as interviews with families or caregivers, other relevant assessments, or interactions with the child.
 - Look for patterns and trends by asking questions such as: Does the child demonstrate number sense verbally and non-verbally? Does the child initiate and respond to prompts to demonstrate number sense? What number sense strategies does the child use? Does the child's behavior indicate interest and engagement with mathematics?
 - For additional information, see Key Terms and Additional Supports.
5. **Interpret** by drawing conclusions about the child's behaviors related to *number sense*.
 - Draw conclusions using the information you analyzed in the step above.
 - Use conclusions to rate the child's performance on the *Number Sense Learning Progression*.

Number Sense Recording Form

Child's Name: _____ **Observer(s):** _____ **Dates:** _____

Directions: Describe important details about the session. Identify all of the number sense skills, knowledge, and behaviors you observe while interacting with or observing the child. For each session fill in the blanks with quantities demonstrated by the child. Keep notes about what you see the child do/hear the child say that is related to number sense.

Child's Skills, Knowledge or Behaviors	Session 1	Session 2	Session 3	Notes
See/know the number of objects instantly up to ____.				
Say or sign number names up to ____.				
Compare two or more sets by estimating how many are in each set.				
Create matching sets up to ____.				
Use math words to compare and describe quantities up to ____.				
Count to compare and describe quantities up to ____.				
Subitize to compare and describe quantities up to ____.				
Match to compare and describe quantities up to ____.				
Use one number name for each object as child counts up to ____.				
Represent a number up to ____ in a variety of ways.				
Use number names with quantities up to ____.				
Understand that the last number counted tells how many in all up to ____.				
Say or sign which number comes next up to ____.				
Say or sign which number comes before up to ____.				
Count out a specified number of items up to ____.				
Write numerals up to ____.				

Summarize:

Total number of skills, knowledge or behaviors across sessions:

Highest number named across sessions. Lists any numbers the child skips:

Numbers consistently represented in a variety of ways:

Highest number and quantity matched:

Analyze Patterns and Trends:

Key Terms and Additional Supports

Key Terms

- **One-to-one correspondence or counting:** “one number is named for each object. The child has to learn to coordinate number words with the physical movement of a finger and the eye along a line of objects, matching one number word to one object until all of the objects have been used up” (Erikson Institute, 2014, p. 53).
- **Subitize:** to instantly know or see quantities without counting.

Support for Gathering

- Allow a child to use verbal and nonverbal expressions to demonstrate number sense.
 - **Verbal expressions** (e.g., naming, labeling, saying, describing)
 - **Non-verbal expressions** (e.g., using objects, taking actions, creating symbols, writing)

Support for Summarizing (Alternatives)

- **Narrative summary idea:** Write a summary statement that describes the child’s number sense skills, knowledge and behaviors across the sessions.
- **Visual summary idea:** Use different colored pencils or highlighters to show the highest number the child is able to count, subitize, match, etc. when looking across sessions.

Support for Analyzing (Identifying Patterns and Trends)

- **Patterns** are behaviors that repeat in predictable ways. For example, does the child demonstrate a wide variety of behaviors related to *number sense*? Does the child tend to skip over certain numbers and/or count an object more than one time?
- **Trends** are the general direction that something is headed (i.e., determine if the child’s behaviors are increasing, decreasing, or staying the same). For example, with correct models and feedback, the child counts higher or more quantities.