Kindergarten Numeracy Development: Matching Numerals and Sets

Developmental aspects	Emerging With direct support… ⟶	Developing With guided support… ⟶	Applying With minimal support… ⟶	Extending ⟶
The Child	With direct support, and teacher modeling, may participate and may attempt to make sense of mathematical experiences.	With guided support, demonstrates a willingness to explore mathematical ideas while participating in problem solving experiences. Is beginning to show an awareness of numbers, space and time used in everyday life.	With minimal support, demonstrates interest in and a willingness to explore mathematical ideas while purposefully participating in problem solving experiences. Communicates an awareness of how numbers, space, and time are used in everyday life.	Shows interest and curiosity while purposefully exploring mathematical problem solving experiences. Perseveres. Makes and explains connections to numbers, space and time as used in everyday life.
Understanding Number				
Matching numerals and sets	With direct support, may recognize/read some numerals and may match numerals and sets.	With guided support, recognizes/reads numerals, and matches numerals and sets with some consistency.	With minimal support, recognizes/reads numerals and matches numerals and sets to 10.	With ease and consistency, works with numerals and sets to 10 and beyond.
The Support/Scaffolding*	The Model: showing, instructing, explaining, directing, making explicit, demonstrating, giving examples	The Coach: structuring, sequencing, focusing, cueing, guiding, organizing, supporting	The Advisor: suggesting, reminding, prompting, monitoring, asking for elaboration	The Mentor: extending, stretching, wondering aloud, exploring, "what if-ing"
*a variety of supports (teachers, peers, environmental, etc.) can be provided at any stage of development				

Scenario: The children are working in a math centre with sets of cards and small manipulative materials (frogs, candles, birds, spiders, etc.). Each set of cards has a different background on it that matches one of the manipulatives (logs, birthday cakes, nests, webs, etc.) and numerals on each card from 1 to 10. The children are using the manipulatives to make sets that match the background and the number on each card (e.g., four frogs for the pond card with the numeral 4 on it).

Direct Support — Sirat is playing with the frogs, making them jump over each other. The teacher provides <u>direct support</u> by *showing* Sirat how to use the cards. First he *demonstrates* how to find a card that matches the frogs by thinking aloud about how to find a card has something to do with frogs. Sirat helps by pointing to a card with a pond on it. Next he *explains* that the numeral tells how many frogs Sirat will need to match the card. He then *instructs* Sirat to count out the number of frogs that match the numeral. With this step-by-step *example*, Sirat is able to choose another card and continue the activity.

Guided Support — Bruno has picked a card that matches his manipulatives, but he is unsure about the quantity shown by the numeral. The teacher gives <u>guided support</u> by *focusing* Bruno on a number line nearby and *guiding* his finger as he counts aloud along the number line until he comes to his numeral. Using the number line, Bruno figures out how many objects he needs, and then makes the set.

Minimal Support — Jared selects a card with a web on it, and quickly picks up a set of spiders. He places them on the card, but has one too many for the numeral indicated on the card. The teacher offers <u>minimal support</u> by *prompting* Jared with a series of questions: "What is your numeral? Now can you count your spiders? Do they match?" Jared recognizes his mistake and changes the number of spiders in his set.

Without Support — Jasleen loves to organize. <u>Without support</u>, she takes all cards with nests on them and puts them in order from 1 to 10. She places the correct number of birds on each card. Then she says, "Here's what would come next—eleven," and makes a set of 11 birds. The teacher *extends* on Jasleen's thinking by *wondering aloud* if Jasleen would like to add to the set of nest cards so other children could try matching numerals greater than 10.

⭐ *Programs that provide limited developmental work, that emphasize symbol manipulation and computational rules, and that rely heavily on paper-and-pencil worksheets do not fit the natural learning patterns of children and do not contribute to important aspects of children's mathematical development.*

Curriculum and Evaluation Standards for School Mathematics, 1989, p. 16