Widely-Held Expectations in Mathematics Development

Birth–3 years	3–5 years	5–7 years
▪ Begin to recognize “one” and “more than one” ▪ Count to nursery rhymes or the alphabet song ▪ Begin to pick out one thing from a group; sometimes find two or three that are the “same” ▪ Begin to identify simple qualities of things like “soft” and “hard” or “hot” and “cold” ▪ Begin to get some ideas of how things are alike and how they are different ▪ May follow the “path” of an object ▪ May use simple quantity words such as “one more cookie” or “more milk”	▪ Recognize and count up to five ▪ Identify portions when sharing ▪ Recognize and name simple shapes (squares, circles, triangles) ▪ Match pictures to actual shapes ▪ Sort using a single attribute ▪ Recognize simple patterns ▪ Learn more qualities of objects (“thick” and “thin”) ▪ Line up two or three objects using size or some other category ▪ Use language to begin to get ideas about space and time (“next to,” “on top of,” “before,” “after”) ▪ Compare objects ▪ Use measurement words (“big and small,” “short and tall,” “near and far”) ▪ May recognize that two is always two and three is always three but does not apply this concept beyond five	▪ Count first by starting back at 1 each time something is added ▪ Begin to pick up counting where they left off, starting with 7 and counting on to 8 and 9 ▪ Count all types of things; play with counting forward or backward ▪ Enjoy counting to 10 and idea of big numbers ▪ Use pattern block and other materials to make and extend patterns ▪ Match objects in one set to objects in a second set ▪ Sequence things from the biggest to the smallest by size or other variable ▪ May insert items into a sequence at the appropriate place ▪ Enjoy lining up according to size ▪ May enjoy card games that help consolidate concepts ▪ Classify objects in a variety of ways ▪ May isolate a set from a collection ▪ May realize that a collection can be sorted in more than one way ▪ Begin to develop a stable idea of a straight line ▪ Try measuring all sorts of things but with non-standard units ▪ Begin to recognize that 10 is 10 or 20 is 20, no matter how objects are arranged in a group ▪ Work with simple number facts showing different sums with many types of materials

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7–9 years	9–11 years	11–13 years
▪ Begin to enjoy counting puzzles and games where they need to find a number between 10 and 99 ▪ Are able to identify sets of objects with 2 or 3 attributes in common (separate triangles by color, size, and thickness) ▪ May order things in a sequence in one set in relation to a sequence in a second set ▪ Use rulers and yard sticks to measure length ▪ Order numbers from 0–10, and then 10–100 and much higher ▪ Group numbers by two, threes, fives, tens, and so on ▪ Begin to classify things in more complex ways and use general categories and sub-categories ▪ Begin to develop the idea of vertical and horizontal lines ▪ Begin to estimate and measure and to use standard units to communicate similarities and differences ▪ Begin to develop part and whole relationships and understand subtraction by separating a whole into parts ▪ Make simple explorations with the concept of place value (combining groups of 100s, 10s and 1s to make different numbers) ▪ Represent more addition and subtraction “facts” in a variety of ways	▪ Begin to understand the number system as a system built on tens particularly when working with base 10 block and other activities ▪ Begin to extend number sequences to take in large numbers from 1,000 to 10,000 and beyond ▪ May work on practical problems involving length, capacity, time, and large numbers; explore patterns in number systems; explore size relationships; build models of numbers 100, 1,000, 10,000; and refine abilities to estimate ▪ Begin to see the need for a special measure ▪ Continue to work on everyday problems involving length and may extend this to area, perimeter problems, using a variety of units ▪ Have a better coordination of parts and whole as related to both time and fractional concepts ▪ Work on many whole number problems ▪ Begin to coordinate vertical and horizontal lines to help with ideas of area ▪ Become comfortable using simple graphs to show relationships	▪ Begin to explore other ways to build number systems—for example, to think about numbers being represented by 0s and 1s ▪ Begin to explore three-dimensional objects ▪ May be curious about making drawings to scale ▪ Begin to explore different simple number sequences which require more than simple addition and subtraction for their extension (2, 4, 8, 16 … or 1, 3, 6, 10 …) ▪ Begin to experience the ideas of mass and volume ▪ Begin to use line and pie graphs to represent information and explore relationships ▪ Begin to explore more complex number relationships and represent ideas in a greater number of ways ▪ Begin to use standard units for finding mass and volume based on many concrete activities ▪ Use a variety of measurement tools ▪ May begin to see the relationships between fractions and decimals ▪ May develop the idea that the whole is equal to the sum of its parts as a basis for the idea of percent (interest rates in savings accounts, cost of sale items 25%) ▪ May have some early experiences with the idea of variable