Michigan Early Childhood Standards of Quality

Mathematics: 3-5 Years

Children begin to develop processes and strategies for solving mathematical problems. 1

a **Explore and begin to make sense of their world through mathematical thinking and strategies.** 1A

1a. 3 Years 3.1A

1 Ask for “three candles” on their birthday cake. 3.1A.1

2 Ask a familiar adult to pour more milk to fill their cup all the way (concept of “more”). 3.1A.2

3 Play with signs, words, and patterns, e.g., Five Little Monkeys or Brown Bear, Brown Bear, What Do You Hear? 3.1A.3

1a. 4 Years 4.1A

1 When building with Legos, search for another wheel, while saying “I only have three wheels.” 4.1A.1

2 Sort colored goldfish crackers, then count how many are in each color group. 4.1A.2

3 Tell a friend that their birthday is in five days. 4.1A.3

4 Make an ‘AB’ pattern using colored manipulatives. 4.1A.4

1a. 5 Years 5.1A

1 Suggest an idea for sharing when there are a limited number of scoops in the sand table. 5.1A.1

2 Use different size blocks, different arrangements, and other strategies to build and re-build a structure that falls, until achieving their goal. 5.1A.2

3 Count the children sitting at the table to answer how many napkins are needed for snack. 5.1A.3

4 Explain to a friend how they figured out how many musical instruments were needed so that each child in the group could have two. 5.1A.4

b **Explore and begin to understand mathematical symbols and language in communicating their explorations and discoveries.** 1B

1b. 3 Years 3.1B

1. Point to a clock and ask if it is time for snack. 3.1B.1
2. Match numeral shapes when completing a number puzzle. 3.1B.2
3. Point out pictures in book that resemble familiar shapes (e.g., sun/circle; roof/triangle; truck/rectangle). 3.1B.3

1b. 4 Years 4.1B

1. Tell about how they put a puzzle together. 4.1B.1
2. Participate in a group activity to predict what will happen to a toy car if the ramp is taller or shorter. 4.1B.2
3. Estimate how many toy frogs they think are in a plastic pond. 4.1B.3

1b. 5 Years 5.1B

1. Use mathematical terms like bigger/smaller than, more/less than or the same when referring to quantities or size of items. 5.1B.1
2. Recognize different ways to represent number such as tally marks, dice, 5/10 frames, and numerals. 5.1B.2
3. Begin expressing simple mathematical problems identifying mathematical symbols such as “+” or “=.” 5.1B.3

c **Develop an increasing ability to recognize mathematical problems in everyday situations at home and in the learning environment, and experiment to find possible solutions.** 1C

1c. 3 Years 3.1C

1. Use a variety of strategies to solve problems, such as trial and error, simple tools, or asking someone to help. 3.1C.1
2. Try to fix things that are broken, such as putting a toy back together or using tape to repair a torn paper. 3.1C.2
3. With support and modeling, explain their thinking when trying to solve problems, such as telling a familiar adult that they couldn't put a toy back together themselves, so now they are asking for help. 3.1C.3
4. Plan ways to solve problems based on their knowledge and experience, such as getting a stool to reach a book that is on a shelf after trying to reach it on tiptoes. 3.1C.4

1c. 4 Years 4.1C

1. With support, explain how they decided that each child would get two crackers from the snack tray. For example, by passing out one cracker to each child, and then counting to make sure that there were enough left for every child to have one more. 4.1C.1
2. Try to put a bead on a shoelace as a bracelet, and then look around for other options to replace the shoelace when the bead doesn't fit. 4.1C.2
3. Stack blocks in several ways until they figure out how to make the tower stay up. 4.1C.3

1c. 5 Years 5.1C

1. Share several ideas with another child about how to keep their block tower from falling. 5.1C.1
2. When their first idea for a solution doesn't work, try to think of other ways to solve their problem or achieve the result they want. For example: when the mosaic tiles they chose for their city artwork are too heavy for the paper, tell a familiar adult they might need to choose something else to work with, or different paper, or maybe even different glue to make it stick better. 5.1C.2

Children show a growing understanding of the concept of number and quantity. 2

a Counting: Explore numbers and number vocabulary with increasing understanding of their relationship to quantity. 2A

2a. 3 Years 3.2A

1 Point to animal counters one-by-one, counting out loud from one to five. 3.2A.1

2 Serve themselves five carrot sticks for snack. 3.2A.2

2a. 4 Years 4.2A

1 Roll a die that lands on 5, then move their game piece five spaces. 4.2A.1

2 Pass out one plate and one cup to each child. 4.2A.2

3 While pretending to launch a rocket, count backwards 5,4,3,2,1 and then shout, "BLAST OFF!" 4.2A.3

2a. 5 Years 5.2A

1 Pass out ten crackers for each child. 5.2A.1

2 Show an understanding of cardinality, or the understanding that the last number said when counting is the total quantity. For example: counting the cards in their hand, and saying, "I have six cards." 5.2A.2

3 Keep track of what they counted and what they haven't counted in a group of objects. 5.2A.3

4 Point out mistakes in counting. 5.2A.4

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b Subitizing: Recognize and name the quantity of objects in a group without counting. 2B

2b. 3 Years 3.2B

1 Tell a familiar adult that there are "only two" Goldfish crackers on their plate after looking but not counting. 3.2B.1

2b. 4 Years 4.2B

1 Recognize that they have five counting bears, and their friend has four, so they have more than their friend. 4.2B.1

2 Demonstrate "conceptual subitizing," or identifying a whole when only seeing parts of it. For example, seeing five cookies stacked and overlapped on a plate and saying that they see five. 4.2B.2

2b. 5 Years 5.2B

1 Recognize some common number arrangements, such as 5 and 5 makes 10. 5.2B.1

2 Mentally separate a large group of objects into two or more smaller groups. For example, recognizing that they have five blueberries, and their sister also has five, so there are ten blueberries in all. 5.2B.2

c Comparing, Adding, and Subtracting Numbers: Begin to understand numbers as sets to be compared, put together, and taken apart. 2C

2c. 3 Years 3.2C

1. Tell who is first and who is second in a race or other scenario. For example, “Sarah finished her snack first, and I finished second.” 3.2C.1
2. Choose the biggest piece of cake. 3.2C.2
3. Look at the two pieces of crackers on their plate, compare that with the three on Laura’s plate and say, “I need one more.” 3.2C.3

2c. 4 Years 4.2C

1. Say that William has more blocks than they do, after counting. 4.2C.1
2. Tell how many children are present after counting how many are absent. 4.2C.2
3. After naming who is missing during the morning message, tell how many children are absent today. 4.2C.3

2c. 5 Years 5.2C

1. Use finger patterns, objects, and counting on to join quantities together. For example, when prompted with “You have 7 cheese sticks, and someone gives you 5 more. How many do you have now?” will start at 7 and counting 8, 9, 10, 11, 12 until they have counted 5 more numbers to find the sum. 5.2C.1
2. Mentally separate larger groups of objects in two or more smaller groups when figuring out quantity. For example, with a plate of 7 apple slices, visually separate into groups of 3 and 4 to be able to easily decide there are 7 slices. 5.2C.2
3. Tell how many children are present after counting how many are absent. 5.2C.3

d Composing and Decomposing Numbers: Begin to understand that numbers are made up of smaller numbers. 2D

2d. 3 Years 3.2D

1. Recognize that parts make up a whole, and whole is bigger than individual parts. However, they may not be able to use numbers or measurements to explain why this is the case. 3.2D.1
2. Trade 2 small items for 1 bigger item. 3.2D.2

2d. 4 Years 4.2D

1. Attempt to label a whole and its parts with numbers, such as explaining that their basket of 4 pieces of play food has 2 pears and 2 oranges. 4.2D.1
2. Recognizes and produces number combinations up to 4. For example, moving a collection of four toy cars to groups of 1 and 3, 2 and 3, 3 and 1, 4 and 0. 4.2D.2

2d. 5 Years 5.2D

1. Mentally separate larger groups of objects in two or more smaller groups when figuring out quantity. For example, with a plate of 7 apple slices, visually separate into groups of 3 and 4 to be able to easily decide there are 7 slices. 5.2D.1
2. Quickly answer questions about the parts of a whole. For example, recognizing that if there are 3 green blocks and 1 red block, there are 4 blocks, or if there are 6 candies then 3 people can share with 2 candies each. 5.2D.2

Children show a growing understanding of shapes and spatial relationships. 3

a Explore and begin to recognize the positional relationships between objects, their environment, and themselves. 3A

3a. 3 Years 3.3A

1 Expand their spatial vocabulary to include more complex terms such as beside and between. 3.3A.1

2 Look over puzzle pieces to narrow down the group to just those that might fit in the space they are trying to fill, without using trial and error for each piece, sometimes. 3.3A.2

3a. 4 Years 4.3A

1 Find a toy that has been misplaced or intentionally hidden. 4.3A.1

2 Play hide-and-seek. 4.3A.2

3 Continue to expand their spatial and directional vocabulary, including terms such as left and right, as well as in front of and behind. 4.3A.3

4 Recognize a taller bar in a bar graph means that bar has “more.” 4.3A.4

5 Begin to build a mental model of a line between dots on a graph to predict where two “lines” might meet. 4.3A.5

3a. 5 Years 5.3A

1 Keep track of themselves and where they’ve been as they move through a maze. 5.3A.1

2 Label or name some locations during play, such as “That corner is home base!” 5.3A.2

3 Move successfully through a simple obstacle course. 5.3A.3

4 Walk around furniture and other people without bumping into them. 5.3A.4

5 Quickly decide if puzzle pieces will fit in the spot they are working on. 5.3A.5

b Explore and begin to analyze two-dimensional and three-dimensional shapes and shape attributes. 3B

3b. 3 Years 3.3B

1. Match more shapes, such as rectangles, ovals, etc., even if they are different sizes or rotated differently, such as pointing out two rectangular blocks as matches, even though one was sideways and the other flat on the floor. 3.3B.1
2. Turn two books to line up with each other, so they can check if they are the same shape, sometimes. 3.3B.2
3. Identify circles and squares and begin to recognize and identify a sphere (ball) and a cube (box). 3.3B.3
4. Begin to compare shapes using simple terms, such as being pointy or tall. 3.3B.4
5. Begin to use blocks to build arches, corners, and enclosures or "rooms," though the constructions may not have interior space and may have been constructed through trial and error. 3.3B.5

3b. 4 Years 4.3B

1. Continue to expand the range of shapes they can match, even with size or rotation differences. 4.3B.1
2. Recognize a wider variety of shapes, such as identifying a book cover as a rectangle, and a line drawn across the angle/corner of a square as forming a triangle. 4.3B.2
3. Use blocks to create the lines of a shape, so their creation looks like a particular shape. 4.3B.3
4. Use shapes as parts of their drawings, such as using a square as the body of a house and a triangle as the roof. 4.3B.4
5. Begin to build arches and enclosures/rooms with interior space, with more understanding of what shapes they will need and how to build it. 4.3B.5

3b. 5 Years 5.3B

1. Point out lines and angles as geometric objects, at least in the context of how they can be put together to form shapes. 5.3B.1
2. Recognize lines and angles (corners) as attributes of shapes when comparing and classifying shapes. For example: noting that a triangle has 3 sides, but a rectangle has 4. 5.3B.2
3. Recognize and identify more complex shapes, such as the trapezoid, rhombus (diamond), and hexagon, as well as more 3-dimensional shapes, beginning to learn the formal terms for these shapes. 5.3B.3
4. Recognize that the faces of 3-dimensional shapes are 2-dimensional shapes, such as identifying the side of a cube/box as a square. 5.3B.4
5. Use more shapes to add complexity to their drawings, such as using 2 rectangles to form the upper and lower arm in a drawing of a person. 5.3B.5

6 Put together simple tangram or pattern block forms, creating new shapes. They may need to follow a model or map. 5.3B.6

7 Draw a line on a simple illustration of a house to show the separation between a triangle and a square (identifying and decomposing shapes). 5.3B.7

8 Use blocks to build taller arches and enclosures/rooms, and begin to build bridges, ramps, stairs, and add roofs to their constructions. 5.3B.8

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c Investigate and begin to understand the concept of a whole and how it can be divided into two (or more) equal parts. 3C

3c. 3 Years 3.3C

1 Recognize that parts make up a whole, and whole is bigger than individual parts. However, they may not be able to use numbers or measurements to explain why this is the case. 3.3C.1

2 Begin to use tools to divide playdough shapes (circle, square, or rectangle) into two or more generally equal parts, through trial and error, and they may not be able to explain how they decided what was “equal.” 3.3C.2

3c. 4 Years 4.3C

1 Attempt to label a whole and its parts with numbers, such as explaining that their basket of 4 pieces of play food has 2 pears and 2 oranges. 4.3C.1

2 Continue to explore and become more accurate in dividing shapes into equal parts. 4.3C.2

3 Begin to identify “half” of a circle (cookie) or square (sandwich), as well as “half” of a countable quantity (crackers) as they apply to “fair shares.” 4.3C.3

3c. 5 Years 5.3C

1 Begin extending their understanding of equal parts to include 1/4 and 1/3, such as 4 parts of a sandwich or separating crackers into 3 equal piles. 5.3C.1

2 Quickly answer questions about the parts of a whole. For example, recognizing that if there are 3 green blocks and 1 red block, there are 4 blocks, or if there are 6 candies then 3 people can share with 2 candies each. 5.3C.2

Children show a growing understanding of patterns, structures, and relationships in math. 4

a Recognizing and Building Patterns: Notice, recognize, copy, extend, and create repeating patterns. 4A

4a. 3 Years 3.4A

1 Put a blue counting bear in the empty spot in a row of yellow bear, blue, yellow, empty space, yellow. 3.4A.1

2 While looking at a pattern of blocks set out by an adult, copy the pattern with their own set of blocks. 3.4A.2

4a. 4 Years 4.4A

1 Continue a pattern set out by an adult, adding a triangle and then a circle to a row of triangle, circle, triangle, circle. 4.4A.1

2 Recognize, identify, and build repeating AB and ABC patterns. 4.4A.2

4a. 5 Years 5.4A

1 Recognize, identify, and build repeating AAB and AABC patterns. 5.4A.1

2 Begin to copy patterns into other materials. For example: looking at an AAB pattern made with yellow and blue counting bears, draw that pattern with yellow and blue crayons. 5.4A.2

b Ordering and Seriation: Arrange objects in order according to changes in a specific attribute, such as size, length, number, color, etc. 4B

4b. 3 Years 3.4B

1 Choose picture books from the library that have main characters who look like them. 3.4B.1

4b. 4 Years 4.4B

1 Set several blocks next to each other, using trial and error to decide which is longest, when working to line blocks from longest to shortest. 4.4B.1

2 Place rods of Unifix cubes in order from shortest to longest based on the number of individual cubes. 4.4B.2

4b. 5 Years 5.4B

1 Use a mental map of ordering as they set stacking cups in a row from smallest to largest. 5.4B.1

Children show a growing understanding of the concepts of quantifying and comparing. 5

a Notice and recognize that things in their environment can be measured (length/height, weight, area, volume, temperature, time). 5A

5a. 3 Years 3.5A

1 Draw scribbles and spirals both inside and outside the lines when asked to "color in" or "fill in" a square (early recognition of area). 3.5A.1

5a. 4 Years 4.5A

1 Participate in a group discussion to decide which shelf will best fit the wooden unit blocks. 4.5A.1

5a. 5 Years 5.5A

1 Ask a familiar adult to help them measure string for a bracelet. 5.5A.1

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b Compare things in their environment and use the language of measurement (lighter, darker, long, longer, big, bigger, etc.) to describe them. 5B

5b. 3 Years 3.5B

1 Compare size with simple terms, such as bigger, smaller, taller, shorter, lighter, and heavier. 3.5B.1

5b. 4 Years 4.5B

1 Set several blocks next to each other, using trial and error to decide which is longest, when working to line blocks from longest to shortest. 4.5B.1

2 With prompting, place blocks somewhat randomly inside two differently sized squares to compare how much space is inside each square (area), with some accuracy. 4.5B.2

5b. 5 Years 5.5B

1 Place blocks tightly against each other to compare the area, or space inside, two differently sized rectangles, with more accuracy. 5.5B.1

2 Point out that one book must be "longer" than another one because the spine is thicker. 5.5B.2

c Use non-standard and standard tools and units of measurement. 5C

5c. 3 Years 3.5C

1. Use a cup to move sand into a bucket, counting out loud as they pour each cupful in, sometimes. 3.5C.1
2. Hold a piece of fruit in each hand to decide which is heavier. 3.5C.2

5c. 4 Years 4.5C

1. Begin to use formal measuring tools, such as tape measures and balance scales, to determine size and weight. 4.5C.1
2. Use informal measuring tools, such as footsteps, hands, or blocks to measure length, volume, and other measurable characteristics. 4.5C.2

5c. 5 Years 5.5C

1. Expand their use of formal measuring tools to include more complex or detailed tools, such as rulers, kitchen and bathroom scales, thermometers, etc. 5.5C.1
2. With support, measure ingredients for making bread. 5.5C.2

Children begin to develop processes and strategies for classifying and using data. 6

a Recognize and classify things in their environment. 6A

6a. 3 Years 3.6A

1. Begin to describe the difference between objects, such as telling that one doll has a blue dress and the other has a red dress. 3.6A.1
2. Participate in a group activity to count how many people in the group have pets. 3.6A.2

6a. 4 Years 4.6A

1. Describe the similarities and differences between objects, such as determining by feel that some of a collection of buttons are fabric-covered and others have holes. 4.6A.1
2. Ask the other children if they have a cat at home and make marks in their journal to count how many. 4.6A.2
3. Chart different kinds of weather with their group over the course of a week or a month. 4.6A.3

6a. 5 Years 5.6A

1. Measure the growth of their seedling every day. 5.6A.1
2. Classify items by their similarities, such as “all of these animals have fur, and these ones over here have scales!” 5.6A.2

b Sort things in their environment into groups based on attributes. 6B

6b. 3 Years 3.6B

1 Sort blocks by material (plastic/wooden) during clean-up time, when directed by an adult. 3.6B.1

2 Sort animals by habitat (farm or forest, for example), when directed by an adult. 3.6B.2

6b. 4 Years 4.6B

1 Organize buttons based on different attributes, such as solid color, stripes, dots. 4.6B.1

2 Sort manipulatives into separate containers during clean up time. 4.6B.2

6b. 5 Years 5.6B

1 Collect leaves and sort by type of tree and/or leaf shapes. 5.6B.1