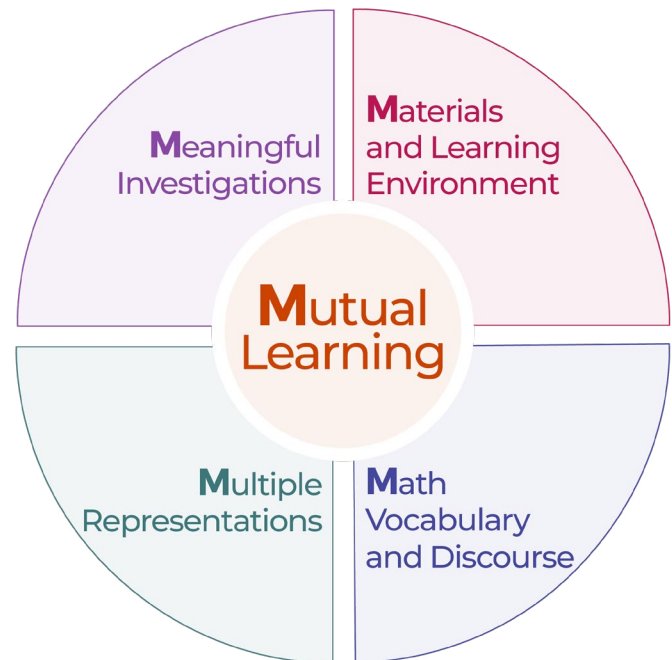


Using M⁵ to Support Adding and Subtracting

This handout provides specific examples for each practice in the M⁵ Early Math Approach to help educators support children in their understanding of addition and subtraction.

The M⁵ Early Math Approach is grounded in supporting positive math mindsets in all children through playful early math experiences. Educators hold the belief that all children have the capacity to learn math and that opportunities for math learning are everywhere—in learning settings, homes, communities, and play spaces.



Mutual Learning

Observe how individual children develop and express their understanding of addition and subtraction. Consider children's demonstrated strengths and needs, languages, cultures, and daily experiences.

- **Observe how children develop and deepen their understanding of addition and subtraction.**
 - ◇ Notice the beginnings of their understanding of properties of addition and subtraction (commutative property, associative property, and inverse property).
 - ◇ Notice what strategies they use to solve addition and subtraction problems (for example, counting on strategies, or composition or decomposition strategies) and highlight these strategies in a whole group setting for other children to learn from.
 - ◇ Notice whether certain types of problems are more challenging (for example, word problems, end-unknown problems, or start-unknown problems).
- **Provide children with different ways to explore addition and subtraction problems, being responsive to children's preferences and abilities.**
 - ◇ Provide opportunities for children to solve addition and subtraction problems written as equations or word problems.
 - ◇ Provide concrete objects that children can use to add and subtract.

- ◇ Consider using number lines, ten frames, or other tools as alternative ways for children to add and subtract.
- ◇ Observe how children interact with others. Provide opportunities for children to choose how they want to work—collaboratively or individually. Individual work time can give children a chance to focus on their math learning without the added challenge of navigating social interactions at the same time. Collaborative work might support children to reason about and explain addition and subtraction with their peers.
- **Notice how children communicate about how they solve problems.**
 - ◇ Some children might use words or gestures to describe adding or subtracting. Others might show their knowledge by drawing or using objects.
- **Notice the languages and vocabulary children use to discuss addition and subtraction and build on these languages to support additional learning.**
 - ◇ Children who are multilingual learners might add and subtract in their home languages, English, or both. Invite children to communicate in a way that is most effective for them.
- **Learn about children’s cultures and daily experiences. Use what you learn to offer meaningful addition and subtraction experiences that are related to children’s lives and cultures.**
 - ◇ Provide children opportunities to solve addition and subtraction problems involving contexts they are familiar with (for example, making purchases at the store, changes in the score in a sporting event, or playing a board game with family members).
 - ◇ Consider ways to use children’s home lives and daily routines to create analogies with different properties of addition and subtraction (for example, the commutative property is like setting the table—it doesn’t matter if you put down 2 blue plates and then 3 red plates. You will still end up with 5 plates. Invite children to think of other routines where the order in which you do them doesn’t matter).

Meaningful Investigations

Offer opportunities for children to question, experiment, and use math to solve authentic problems of interest in their daily lives or across content areas.

- **Use everyday events to introduce children to ideas about adding and subtracting.**
 - ◇ “We have 15 children in our class. Only 11 of them are here today. How many children are absent?”
- **Encourage children to add and subtract in the context of real-world problems or topics they are exploring across content areas.**
 - ◇ “We need to find out how many decorations we made as a class to help with the end-of-the-year school celebration. How might we find out how many we made as a class?”
 - ◇ “I wonder how much our plant has grown. Last week it was 9 inches tall and today it is 15 inches tall.”
- **Provide playful learning experiences that encourage children to add or subtract.**
 - ◇ Play a board game with two or more dice. Encourage children to add or subtract the numbers on a die to determine how many spaces they can move forward.
 - ◇ Support children to add or subtract when playing outdoor games. For example, children might add to keep score when playing basketball, soccer, or four square.
 - ◇ Consider providing these materials for children to take home and play math learning games with their family members.

Materials and Learning Environment

Provide open-ended materials that support children to add and subtract.

- **Offer materials that respond to children’s cultures, interests, strengths, and areas for growth. Some materials might include the following:**
 - ◇ math manipulatives, such as base ten blocks, number lines, counting chips, ten frames, and dice
 - ◇ loose parts and collections of objects (for example, buttons, beads, erasers, craft sticks, dominoes)
 - ◇ objects children might choose based on their interests (for example, rocks, stickers, toys, trading cards, popular characters from movies or TV shows)
 - ◇ recycled materials and natural items shared from children’s homes and neighborhoods (for example, leaves, sticks, rocks, shells, and bottle caps)

- Offer a variety of materials so that children are able to exercise choice and try out different mathematical strategies.
- Read books that include opportunities to add and subtract in children's home languages, English, or both. Here are some examples of books, in English and Spanish, that provide opportunities to add or subtract:
 - ◊ [*Elevator Magic*](#) (or [*Magia del ascensor*](#) in Spanish) by Stuart J. Murphy
 - ◊ [*Earth Day—Hooray*](#) by Stuart J. Murphy
 - ◊ [*Spaghetti and Meatballs for All!*](#) by Marilyn Burns

Math Vocabulary and Discourse

Encourage children to communicate about addition and subtraction.

- Use words or phrases that describe adding and subtracting in children's home languages, English, or both.
 - ◊ "How many more . . ."
 - ◊ "Add . . ."
 - ◊ "Take away . . ."
 - ◊ "How many are left?"
 - ◊ "How many all together?"
- Use open-ended questions and prompts to encourage children to share their thinking about addition and subtraction and reflect on their growth and learning.
 - ◊ "How do you know how many will be left?"
 - ◊ "How might we find out how many we have all together?"
 - ◊ "How can you use fact families to add and subtract larger numbers?"
 - ◊ "Which strategies do you prefer for adding and subtracting, and why?"
- Provide opportunities for children to learn from one another and work collaboratively.
 - ◊ Consider using routines such as "Think-Pair-Share" to support children to explain, question, compare, and reason about adding and subtracting.
 - ◊ Offer opportunities for children who communicate in the same language to work together.



- Offer sentence starters, or language frames, to support children to use language to communicate about adding and subtracting. Consider when it is appropriate to provide language frames in children's home languages.
 - ◇ "I had _____, and I added _____. Now I have _____ in all."
 - ◇ "_____ más _____ es _____."

Multiple Representations

Offer multiple ways for children to explore addition and subtraction.

- Encourage children to explore different strategies for adding and subtracting.
 - ◇ Invite children to use multiple strategies or materials to solve the same problem. For example, children might solve $12 + 11$ by using a collection of objects or base ten blocks. Children can model the same problem using ten frames or a number line.
- Children might use different ways to communicate their answers to addition and subtraction problems, including using numerical symbols, drawings, movement, or concrete objects.

