

CHAPTER 2: Foundations of Addition and Subtraction

MINI-MODULE C

Apply Addition and Subtraction

Objectives

This mini-module aims to help teachers:

- Describe how children develop addition and subtraction skills.
- Identify how addition and subtraction skills can be applied and used to solve problems.
- Practice a new teaching activity.

Recommended Materials

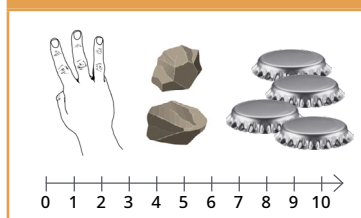
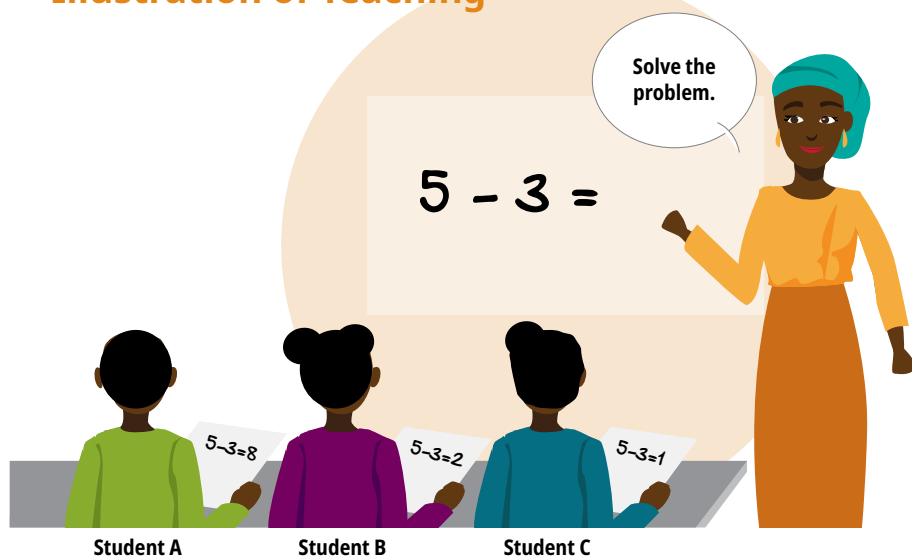


Illustration of Teaching



REFLECT:

- Which children made mistakes?
- What do you think they misunderstand?
- How would you address these mistakes?

Ideas to Consider

The students were asked to solve a subtraction problem written on the board. It seems that Student A added $5 + 3$ instead of subtracting $5 - 3$. It seems that Student C made a mistake in subtracting $5 - 3$ by finding a difference of 1. There are different reasons the children could have made these mistakes, and the teacher should identify what they misunderstand. The students might not understand the symbols written on the board, or they might not understand how to subtract. Student A might mix up addition and subtraction because they have not had much practice or because they are more familiar with addition than subtraction.

After assessing the mistake, the teacher should review what the children do not understand. They could use materials (e.g., counters, number line) to review subtraction, or they could review the math symbols (+ =). They could also tell a story about subtraction, such as: *There were 5 children playing football, and 3 went home. How many children were left?*



ACTIVITY: SOLVE A WORD PROBLEM

This activity can be completed alone, in pairs, or with a group of teachers. Discuss your responses to the questions.

Purpose: Consider strategies for solving everyday problems using operations.

Materials needed: Writing materials (e.g., pen and paper).

Instructions

- Read the story: ***In one classroom there are 9 girls and 8 boys. How many children are there in total?***
- Reflect and discuss: ***Which operation is needed to solve the problem? How do you know?***
- Write the math sentence for this story using numbers and symbols.
- Solve the math sentence.
- Reflect and discuss: ***What strategy did you use to add the numbers? Can you think of any other strategies that children might use?***

What Do Children Learn about Applying Addition and Subtraction?

Teachers should support students in developing a deep understanding of addition and subtraction. They should have plenty of practice adding and subtracting using materials before they are introduced to the symbols (+ =). They can also be introduced to addition and subtraction with examples from the real world (e.g., a word problem or role play) from the very beginning. Children begin to build addition and subtraction skills in the community at a young age, and the topics they learn in class should be linked to the real world.

With practice, children can recall addition and subtraction facts from memory. This skill helps them later on when they work with large numbers. With practice, children begin to create their own strategies for addition and subtraction and can solve problems mentally even when they don't recall the addition and subtraction facts.

Children should understand that addition and subtraction are opposite actions. For example, adding 2 and then subtracting 2 gives us the quantity we started with. Understanding this relationship will help students identify fact families and recall basic facts. For example, 3, 5 and 8 make a "fact family" with these addition and subtraction facts: $3 + 5 = 8$, $5 + 3 = 8$, $8 - 5 = 3$, and $8 - 3 = 5$.

Make connections for students

Hawa has 4 mangos and 3 oranges. How many fruits does she have in total?

Use counters:



Use pictures:



Write with symbols:

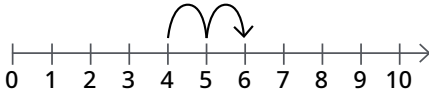
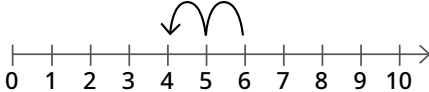
$$4 + 3 = 7$$

Read the symbols:

"4 plus 3 equals 7"

Use math words:

"This is addition. We found the total."

Children should be able to . . .	What does this mean?	Example
Solve problems based on everyday life using addition and subtraction	Add and subtract in everyday situations (in the real world or through role play and word problems).	Hawa had 5 mangos, and she picked 3 more from a tree. How many did she have in total?
Identify the relationship between addition and subtraction	Addition and subtraction are opposite actions. Addition means to put more, or increase. Subtraction means to take away, or decrease.	$4 + 2 = 6$  $6 - 2 = 4$ 
Recall facts	With practice, children store and recall addition and subtraction facts.	What is $12 - 5$? "I know $12 - 5$ is 7."
Create strategies	Use composing and decomposing to add or subtract numbers.	What is $6 + 5$? "I know that 6 is $5 + 1$, so I can add $5 + 5$ to get 10, and then $10 + 1$ to get 11."
Use addition and subtraction symbols	Read, write, and interpret addition and subtraction sentences with symbols.	$3 + 2 = 5$ $5 - 2 = 3$ $2 + 3 = 5$ $5 - 3 = 2$ $5 = 2 + 3$ $3 = 5 - 2$

Reflection

Write your responses down or discuss your ideas with your colleagues:

- Think of your own students. Which skills from the above table do you think they would find challenging? Why? How can you support them?
- Share your idea of an addition or subtraction word problem that is relevant to your students' lives.
- What materials could children use to solve your word problem?
- Do you think your students could solve this problem mentally? What facts or strategies could they use?
- What mistakes could children make when solving your problem? How could you address them?

Teaching Practice

This practice activity may be completed by teachers with their own class or with a smaller group of students.



ACTIVITY: RELATIONSHIP BETWEEN ADDITION AND SUBTRACTION

Purpose: Identify that addition and subtraction are opposite actions.

Materials needed: At least 10 objects (e.g., seeds) and writing materials (e.g., pen and exercise book) for each student.

Instructions

- Give 10 objects (e.g., seeds) to each student.
- Say: **Count 6 seeds and put them on your table. Now, add 3 more seeds.**
- Ask: **How many seeds do you have in total?**
- Say: **Yes, there are 9 seeds. How can we write this as a math sentence?**
- Write on the board and read aloud with students: $6 + 3 = 9$
- Say: **Now, take your 9 seeds, and remove 3 seeds. How many are left? Yes, there are 6 seeds left.**
- Write on the board and read aloud with students: $9 - 3 = 6$
- Say: **What was happening with the seeds? We added 3, and then we subtracted 3. We got back to the number that we started with, 6. Adding is putting more and subtraction is taking away.**
- Repeat with other examples (e.g., start with a group of 6, take away 5, then add 5 back).



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