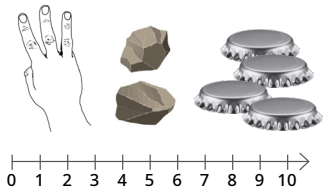
# Understand Subtraction

## Objectives

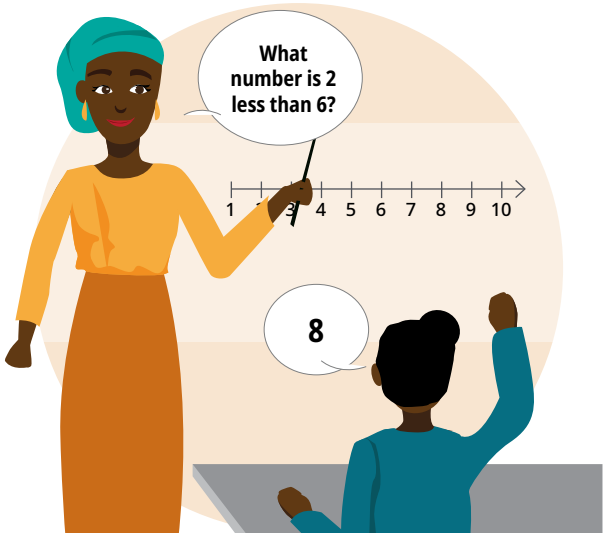
This mini-module aims to help teachers:

- Identify some strategies and materials that can be used to teach and practice subtraction.
- Practice a new teaching activity.

## Recommended Materials




## Illustration of Teaching




**REFLECT:**

- What could you do to assess why the child made this mistake?
- What are some reasons that you can think of for making this mistake?

## Ideas to Consider

The student made a mistake by responding 8, which is 2 more than 6. The student added the numbers instead of subtracting. There could be different reasons for this mistake. The student may not understand how to use counters or a number line to subtract. They might have misunderstood the question, or they might understand addition better than subtraction. They may not know the order in which to subtract the numbers. In this problem, the larger number comes second, not first. The problem might suggest to them this equation: 2 – 6 = .

The teacher should assess why the child misunderstood the problem, and plan activities to address their misunderstanding. They should make sure the child understands the question and should introduce the meaning of the phrase “less than.” They could give more examples and guide students to subtract using the materials. They could also introduce a word problem to link subtraction to everyday life, using a situation that children would be familiar with.

## ACTIVITY: STRATEGIES FOR SUBTRACTION

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

**Purpose**: Identify some strategies for subtracting two numbers

**Materials needed**: Counters

**Instructions**

- Read the story aloud: ***Musa had 7 bananas, and he ate 4 of them. How many bananas did Musa have left?***
- Reflect and discuss: ***How do you think children would solve this problem? What strategies could be used?***
- Try each method in the box below.

**Method 1**: Subtract by taking away

- Count 7 counters for the bananas Musa started with:

"1, 2, 3, 4, 5, 6, 7"

- Count the 4 he ate. Pick them up and take them away.
- Count how many are left:

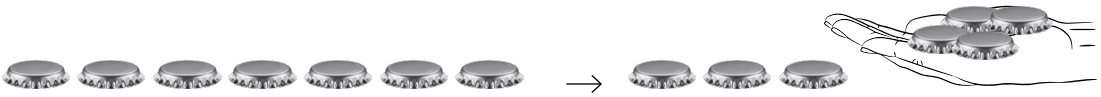
"1, 2, 3"

**Method 2**: Subtract by counting back

- Count 7 counters for the bananas Musa started with:

"1, 2, 3, 4, 5, 6, 7"

- Pick up 4 counters for the bananas he ate, and count backward from 7 as you do so.



"7, ... 6, 5, 4, 3"

- Reflect and discuss: ***What other methods have you and your students used for addition?*** (e.g., number line, drawing a picture)

## What Do Children Learn about Subtraction?

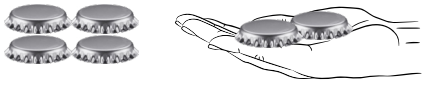
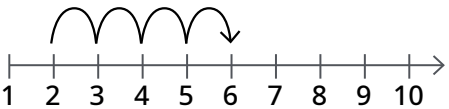
Children should learn two different meanings of subtraction. One is the idea of taking away, or decreasing, one quantity by another. Another meaning is the idea of the "difference" between two quantities. Children should learn some properties of subtraction, such as:

- The order of numbers in subtraction matters. 5 – 4 is not the same as 4 – 5.
- Subtracting 0 doesn't change the number (5 – 0 = 5).

The subtraction problem 8 – 2 can be thought of as "what is 8 take away 2?" This can be solved by taking away, or by counting back. In "**taking away**," one group is removed from another. 8 – 2 can be solved by counting out 8 objects, removing 2 of them, and counting how many are left: "1, 2, 3, 4, 5, 6." This can also be solved by decomposing 8 into 6 and 2, and taking away the 2. To solve a subtraction problem by "**counting back**," start at the first number and count back by the number being subtracted. To solve 8 – 2, start at 8 and count back by 2: "7, 6." As with counting on for addition, counting back can be shown with counters or a number line.

The subtraction problem 8 – 2 can also be thought of as "What is the difference between 8 and 2?" This could mean "How many more is 8 than 2?" or "How many fewer is 2 than 8?" To find the **difference**, subtract by **counting up or counting back** from one number to the other. To solve 8 – 2, start at 2 and count up to 8: "3, 4, 5, 6, 7, 8" to find how many more. Or start at 8 and count back to 2: "7, 6, 5, 4, 3, 2" to find how many fewer. Either way, 6 numbers are counted. This means that the difference between 8 and 2 is 6.

Subtraction is related to decomposition and comparing, which are introduced in *Chapter 1: Numbers and Quantities*. To decompose a number, children break it down into its parts. To compare numbers, children identify numbers that are greater or fewer than other numbers. These skills prepare children to understand subtraction.

| Children should be able to . . . | What does this mean? | Example |
|---|---|---|
| **Understand subtraction as decreasing an amount** | Understand the meaning of subtraction as decreasing the size of one set. | I have 7 bottle caps. I give my friend 3 of those bottle caps. How many do I have left? |
| **Understand subtraction as difference** | Understand the meaning of subtraction as how many **more** or **fewer** one set is than another. | Musa has 7 bananas. John has 3 bananas. How many more bananas does Musa have than John? |
| **Subtract by taking away** | Subtract by taking away one group from another. | 6 – 2 =<br>What is 6 take away 2?<br><br>Count out 6 objects, take away 2, and count how many are left:<br>  <br>"1, 2, 3, 4" |
| **Subtract by counting back** | Subtract by counting back from a number. | 6 – 2 =<br>What is 2 less than 6?<br><br>Count out 6 objects. Pick up two, counting back as you pick up each one:<br>  <br>"6 ... 5, 4"<br><br>Raise 6 fingers and count back 2 (put 1 finger down with each count):<br>  <br>"6 ... 5, 4" |
| **Subtract by counting up to** | Subtract by counting up to a number. | 6 – 2 =<br>How many **more** is 6 than 2?<br><br>*Count up from 2 to 6:*<br>  <br><br>Answer: 4 |

## 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?
- How could you show "counting back" using a number line?
- What challenges do you think children might have when "counting back"? How could you address them?
- Why do you think it is important for children to learn different strategies for subtraction?

## Teaching Practice

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

### ACTIVITY: SUBTRACT WITH COUNTERS AND A NUMBER LINE

**Purpose**: Follow instructions to subtract using counters and a number line.

**Materials needed**: At least 10 objects (e.g., seeds) for each student and a number line from 0–10 on the board.

**Instructions**

- Give 10 objects (e.g., seeds) to each student.
- Say: ***Count 5 seeds and put them on your table. Make sure you have 5 seeds. Now, take away 3 of them. Pick them up as you count them, and move them away.***
- Ask: ***How many seeds do you have left?***
- Invite different students to share.
- Say: ***Very good. We counted a group of 5, and took away 3. There are 2 seeds left.***

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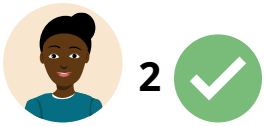
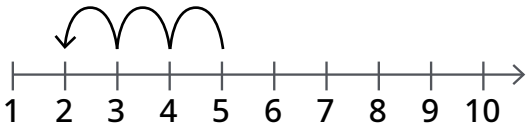
|  2  |  8  |
| ***I made a group of 5 and took away 3. I have 2 left.*** | ***I made a group of 5 and took away 3. I have 8.***<br>*(Tip: Make sure students understand how to subtract using counters. They may not understand that they should take away 3 seeds from their group of 5, rather than taking them from another group of counters on their desk.)* |

- Show 5 minus 3 using the number line on the board:




- Repeat with other subtraction sentences.



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