

Home Connections in Mathematics

Supporting Subtraction Understanding

“What people who are numerate really do is that, when they are given a problem, they look to the numbers first, they look for a strategy –a strategy that will be a really efficient, elegant strategy given those numbers. Someone who is not numerate uses the same strategy for all problems no matter what the numbers are.”

Many TVDSB students have been working with their teachers to develop a deeper understanding of addition, subtraction, multiplication, and division and strategies that may support them in producing reasonable answers.

Parents/guardians often express concern that their children are learning methods that they, as parents, did not learn in school and wonder how they can support their children in this context. This newsletter is intended to offer some support for parents/guardians.

Subtraction is more than ‘take-away’

When we subtract, we find the difference between two numbers. We do this in a variety of contexts.

- a) **Separating/Removing:** “Faizal had 3 erasers and gave 2 to his friends. How many does he have left?”
- b) **Joining/ Adding:** “Cara had some markers and got 3 more. She now has 11. How many did she have at the beginning?”
- c) **Parts-Whole:** “The fruit bowl has 8 pieces of fruit in it: all are bananas or mangoes. If 6 are mangoes, how many are bananas?”
- d) **Comparison:** “The green team has 3 more players than the yellow team. The yellow team has 6 players. How many players are on the green team?”

Each of these situations is important. Students need to understand that these situations call for finding the difference between two numbers. Ontario students are quite good at *performing subtraction*, but have learning to do when it comes to seeing that subtraction is required.

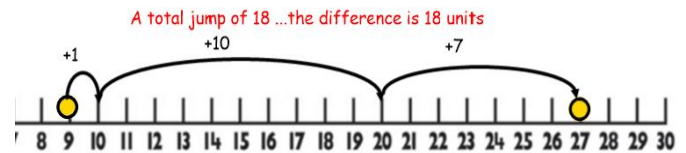
What strategies help deal with difference?

Consider the following subtraction: 27
 High-achieving students deal with this difference using **reasoning strategies which** $- 9$
may include strategies shown below –they may rarely use the standard North American algorithm.

Splitting: This strategy involves an understanding that all numbers can be broken up to make working with the numbers easier. This student sees the hidden 7 inside the 9 and subtracts in two parts (7 and then 2) to make the work easier.

$$\begin{array}{r} 27 - 9 \\ 27 - 7 - 2 \\ \hline 20 - 2 = 18 \end{array}$$

Jumping: This strategy involves an understanding that numbers can be shown on a number line and if subtraction is difference or distance, we can travel that distance in a way that makes sense. This student jumps to a friendly number (10), jumps by 10, and then covers those last 7 spaces to see a big jump of 18.



Compensating: Sometimes it may be more helpful to do too much and then undo the extra that you did. In this case, the student knows the patterns in

subtracting 10 to get to 17 and then knows she took off 1 too much and puts that back on to get

I jumped back up 1 row (removed 10) then put 1 back on ...the difference is 18.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Note: In the original image, a red arrow points from 27 to 17, and another red arrow points from 17 to 18.

to 18. Ultimately, we would like our students to understand how our number system works and what operations mean. When those understandings are in place, students will have a variety of strategies at their fingertips and be truly numerate.

“Learning a range of strategies and the connections among them will contribute to overall number sense”
 Van de Walle et al., (2014)