Learning Guide

Math That Works: Addition/Subtraction Strategies

In this video, a Grade 3 class uses three common strategies for solving addition and subtraction problems:

- the open number line
- compensation
- breaking numbers apart.

This learning guide is designed for use by instructional leaders and learning communities, or as a self-paced study to explore addition and subtraction strategies.

This learning guide is intended for use after viewing the video Addition and Subtraction Strategies (length 5:22).

General Synopsis: There are many ways kids can solve mathematics problems beyond the traditional methods. This resource covers three different strategies for solving addition and subtraction problems.

Key understandings:

- Students can use a variety of strategies to solve addition and subtraction problems.
- The strategy used by students may depend on the numbers in the problem.
- Students should be able to explain the strategy they are using and compare their strategy with those used by other students.
- An open number line, sometimes called an empty number line, has no numbers or markers on it. Students may move forward or backward on the number line in non-proportional leaps to find a solution.
- Subtracting by counting up is a powerful way to subtract.
- Benchmark numbers are numbers that are easy to calculate (e.g., multiples of 10).
- Compensation is a strategy in which you add to or subtract from a number to create an easier number to work with, then compensate at the end to keep the total correct.
- Students may break numbers apart by place value to make adding easier (also called decomposing numbers).

Questions for discussion:

Open Number line 0:00 – 2:54

- How can an open number line represent student thinking?
- When solving the problem on the open number line, one student went from 62 to 91 and the other from 91 to 62. Why are both solutions acceptable?
- What other “jumps” along the number line might a student use to solve 91 – 62?

Compensation: 0:54 – 3:46

- When might a student choose to use compensation as a strategy for adding? For subtracting?
- When numbers are more than 3 away from a benchmark number, compensation is usually not the preferred strategy. Why?

Breaking Up Numbers: 3:55 – 5:13

- Why is breaking up numbers a suitable strategy for adding 46 and 34?
- Would this strategy work for numbers larger than 100? Why or why not?

Resources:

- ARPDC, *Additive Thinking*: http://learning.arpdc.ab.ca/mod/page/view.php?id=9252
- *Teaching Student-Centered Mathematics;* Van de Walle, Karp, Lovin & Bay-Williams; 2014

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