



Problem of the Week

Problem A and Solution

Counting Collections

Problem

The students in Riverside Public School love to play a game called “Counting Collections”. In this game, the students collect objects, and the student who has collected the most objects wins.

Santosh has collected 262 erasers, 451 buttons and 173 pencils. Alyssa has collected 489 straws and 446 rocks.

To estimate who collected the most objects, they round the total number of each type of object, and then use the rounded numbers to calculate the total for each player. Santosh rounds all the numbers to the nearest 100. Alyssa rounds all the numbers to the nearest 10.

- (a) Based on his rounded calculation, who does Santosh think won the game?
- (b) Based on her rounded calculation, who does Alyssa think won the game?
- (c) Who is correct? Justify your answer.

Solution

- (a) Rounding to the nearest 100, Santosh collected approximately $300 + 500 + 200 = 1000$ objects and Alyssa collected approximately $500 + 400 = 900$ objects. So Santosh thinks that he is the winner.
- (b) Rounding to the nearest 10, Santosh collected approximately $260 + 450 + 170 = 880$ objects and Alyssa collected approximately $490 + 450 = 940$ objects. So Alyssa thinks that she is the winner.
- (c) The actual totals are $262 + 451 + 173 = 886$ for Santosh and $489 + 446 = 935$ for Alyssa. So Alyssa collected more objects and is therefore the winner. The estimation when rounding to the nearest 10 is more accurate than when rounding to the nearest 100.



Teacher's Notes

When we use rounding to estimate the results of calculated values it is important to remember that this is an approximation of the actual result. Estimations can be valuable, especially in knowing when an answer is reasonable or unreasonable. However, there is a margin of error when we use rounding.

In this problem, when we see estimated totals that differ by 100 when the numbers were rounded to the nearest 100, we should not assume that we have enough information to make a conclusion about which actual total is greater. Rounding to the nearest 10 gives us a better estimation, but it is still an approximation. However, given that we only have five numbers in our calculations, and the difference between our estimated totals is more than 5×10 , we should have more confidence that our conclusion is correct in this case.