



A Balanced View of Equality¹

Try this with your students:

$$8 + 5 = \square + 4$$

What do you think students might do? Why?

(Students who see '=' as a call for a mathematical action will put 13 in the box. They interpret '=' to mean they are to operate on (add, subtract, etc.) the numbers preceding '='. This suggests that they do not see '=' as expressing a relationship between the two quantities '8 + 5' and ' $\square + 4$ '. Students who can reason algebraically understand that the choice of unknown number must preserve equality between the two sides.)

Extension:

$$8 + 4 = \square + 9$$

$$8 + 3 = \square + 9$$

$$8 + 2 = \square + 9$$

$$8 + 1 = \square + 9$$

Get students to make a conjecture about what happens to the number in the box as 4 decreases to 1.

Let $8 + a = b + 9$. What happens to b as a decreases? What if a increases?

¹ Based on the work of T. P. Carpenter, et al., at NCISLA University of Wisconsin, Madison.