

Activity 12.5 OPEN SENTENCES

Pose several open sentences. Here is a sampling for operations with decimals:

$$\begin{array}{llll} 0.5 + \square = 5 & 0.4 + \square = 0.6 & 4.5 + 5.5 = \square - 1 \\ 0.3 \times 7 = 7 \times \square & \square \times 4 = 4.8 & \square = 2.3 - 0.5 & 2.4 \div \square = 4.8 \div 6 \end{array}$$

Discuss how students solved the problems. After using open boxes, begin to mix in variables so that students can see the variable as representing a missing value:

$$\begin{array}{llll} 3.6 - n = 3.7 - 4 & n + 0.5 = 0.5 + 4.8 & 1.5 + 2.7 = n + 2.8 \\ 6 \times n = 3 \times 8 & 15 \times 27 = n \times 27 + 5 \times 27 & 1 = 0.5 \div n \end{array}$$



Teaching Tip

Notice that each open sentence is simultaneously addressing important number relationships and number sense, so they are excellent choices for warm-up problems or learning centers.

Open sentences are an excellent opportunity to explore inequalities. Consider replacing the equal sign in any of the equations in Activity 12.5 with a $>$ or $<$. What is now possible for the missing value or the variable? Not just one answer, but many (in fact, infinitely many). Since students are more used to equations, they are likely to find the value that makes it

equal and then struggle to decide how to adjust the answer to create the inequality. They may begin with trial and error, but students eventually should be able to use reasoning, also called relational thinking.

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From Van de Walle et. al. (2014). *Teaching Student-Centered Mathematics Grades: Developmentally Appropriate Instruction for Grades 6 – 8* (2nd Ed.). Toronto: Pearson Education, Inc. (p. 230).