

ACTIVITY 10.13**How Many Ways?**

Select a number that students are working on, such as 8. The task is to explore how many different ways there are to add two numbers to make 8. Students should use numbers, words, and pictures to show what they have found out. If students think they have solved this problem for 8, have them try a different number.

Many students will approach “How Many Ways?” in a seemingly haphazard fashion, writing down all of the sums they can think of in any order. Other students will try to make an orderly list such as $1 + 7$, $2 + 6$, $3 + 5$, $4 + 4$. They often forget the combinations with 0. There will most certainly be a discussion about the “turnaround” combinations or commutative pairs. That is, is $2 + 6$ different than $6 + 2$? Students should decide how they think the combinations should be counted. The most interesting generalization will appear if the commutative pairs are counted separately. In that case, there is always one more combination than the number itself. Eight has nine combinations.

From Van de Walle, J. A. & Lovin, L.H. (2006). *Teaching Student-Centered Mathematics Grades K – 3*. Toronto: Pearson Education, Inc. (p. 289).