



Welcome to Ms. Green's classroom, where students enjoy solving math problems together!

I have been teaching math in elementary school for 30 years.

I love engaging students in mathematical discussions that stimulate their thinking. Children learn to explain their ideas, justify their math reasoning to each other, and ask questions to further their understanding. As students engage in making sense of problems, they become more confident and successful in math.

I created Ms. Green's classroom to illustrate students making sense of mathematics. In this classroom, students work on solving accessible, but unfamiliar, problems that challenge them and stimulate their curiosity. Under Ms. Green's guidance, they strengthen their math power as they learn to use the **eight mathematical practices** described in the Common Core.

(Practice Standard 1) In *Penguins on Parade*, you see many instances where students **make sense of problems and persevere in solving them**. On page 8, Jayden helps the class get started on the problem when he suggests counting by tens. On pages 12–14, Zoe finds an entry point, counting by ones. On page 18, she again counts by ones to check that Tyler's prediction is correct. On page 19, Trevor begins to feel success when he and Zoe figure out how to use the pattern Tyler mentioned. On pages 25–27, the students persevere to make sense of the pattern that they are using.

(Practice Standard 2) Trevor, Zoe, and their classmates frequently **reason abstractly and quantitatively** as they make sense of the quantities in the problem. On page 13, Zoe and Trevor begin to add on tens without referring to them as penguins, decontextualizing the situation. On pages 20–21, Kayla and Ellie describe how they have used the decontextualized quantities in the problem on a number line. Then on page 22, Ellie puts the quantities back in context, explaining the meaning of the numbers they have broken apart. On page 25, Ben and Rosie use the penguin context to justify why the subtotals all end in 8.

(Practice Standard 3) Ms. Green’s students often **construct viable arguments and critique the reasoning of others** as they explore counting by tens starting from 8. On page 15, Trevor tries to convince Zoe that they are not counting by tens but only counting by ones. Then on pages 15–17, Ms. Green enlists the class in helping Trevor and Zoe make sense of Zoe’s list. On page 18, Tyler suggests there is a pattern in the list that helps him determine what comes next. Zoe and Trevor begin to analyze the pattern on page 19. On pages 24 and 26, Ms. Green asks all the students to think about the reasons for the pattern. As the class discussion continues, students justify their conclusions about the pattern.

(Practice Standard 5) As Zoe and Tyler work, we see Zoe **use appropriate tools strategically**. Following Ms. Green’s suggestion on page 10, Zoe uses 10-frames to add on tens. Then on pages 12–14, she uses paper and pencil to record their subtotals, establishing a written record that helps the class.

(Practice Standard 6) The students work together to **attend to precision**. On page 27, when James says that one number goes up and the other stays the same, Trevor clarifies the statement, saying they keep getting one more ten while the ones stay the same. Zoe then adds more detail.

(Practice Standard 7) We see Ms. Green’s class **look for and make use of structure** to figure out how to count by tens from a non-zero number. On page 18, Tyler alerts the class to the regularity in Zoe’s list and predicts that 48 must be next. This leads the class to notice the pattern and try to make sense of it on pages 19 and 25–27.

(Practice Standard 8) Ms. Green’s students **look for and use repeated reasoning**. On page 21, Ellie and Kayla decompose 10, adding 2 to the starting number, 8, then adding the new 10 to the remaining 8. The students can generalize this strategy to help them add 10 to 18. Trevor and Zoe are also using repeated reasoning on page 19 when they say that every time they add 10, the ones will stay the same, and the tens will increase by 1 ten.

Ms. Green’s students are learning to be successful problem-solvers. Ms. Green guides them in using practices that help them take a flexible approach to a variety of math problems. As you integrate these practices into your math lessons, I feel sure you will see your students “use their math power” to understand and solve math that may be challenging at first.

—Nancy Belkov

PS: You’ll find additional information and suggestions for using this book at www.SDE.com/mathpower.