



## 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)** Throughout *Hatching Butterflies*, Ms. Green's class works to **make sense of problems and persevere in solving them**. On page 8, Carlos struggles to find an entry point to the problem, insisting that they should not subtract. On page 13, he and Hannah discuss the problem and ultimately find a solution. On page 20, Ms. Green engages the class in making sense of Carlos and Hannah's method, and on page 26, we see them persevere to figure out why they can solve the problem using either addition or subtraction.

**(Practice Standard 2)** In several instances, Carlos and his classmates **reason abstractly and quantitatively** to make sense of the quantities in the problem. On page 9, Carlos reasons that if they subtract, 8 butterflies will fly away, leaving them well short of the 21 they need. On page 21, Tyler and Kayla question whether 21 makes sense as an answer, since 21 more butterflies would give them too many.

**(Practice Standard 3)** There are many examples where we see Ms. Green's students **construct viable arguments and critique the reasoning of others**. Initially, Carlos does not ask

Hannah why she subtracted (even though he copied her work), so Ms. Green encourages him to ask questions. On page 10, Carlos explains his objection to Hannah’s use of subtraction and tells her why they should add butterflies rather than take some away. Through discussion on pages 13 and 14, they figure out a solution. On page 21, Tyler and Kayla ask questions about the solution, and on pages 26 and 27, Hannah and Carlos discuss how they can justify the idea that you can add or subtract to solve the problem.

**(Practice Standard 4)** Hannah and Carlos make use of the number line to **model with mathematics**. Hannah uses a number line to show the relationship between the quantities in the problem on page 12. On page 26, she uses the number line to show why they can subtract the butterflies they have to find the unknown quantity.

**(Practice Standard 5)** Carlos and Hannah’s work with the number line is also evidence that they **use appropriate tools strategically**. On pages 13 and 14, they use it to identify the missing part between 8 and 21 and as an aid in finding the solution. On page 27, they use the number line to reflect on why they can solve the problem by adding on or subtracting.

**(Practice Standard 6)** The students work together to **attend to precision** in several instances. On page 19, Hannah helps Carlos by specifying the size of each jump on the number line. On pages 21 and 22, Tyler questions them about their answer, and the partners quickly respond.

**(Practice Standard 7)** Carlos and Hannah **look for and make use of structure** to figure out how many more butterflies need to hatch. On pages 13 – 15, they add up from 8 to 21, first adding on 10, then 2 more to get to the next multiple of ten, then 1 to get to 21. They then combine the amounts they added on. Using this structure, they could have solved many different problems, perhaps adding up from 9 to get to 25 or from 8 to 31 by adding two tens first to get to 28, then continuing up to 31.

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](http://www.SDE.com/mathpower).