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Common Core Mathematics in a PLC at Work™, Grades 6–8

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Study Guide

This study guide is a companion to the book *Common Core Mathematics in a PLC at Work™, Grades 6–8* by Diane J. Briars, Harold Asturias, David Foster, and Mardi A. Gale. *Common Core Mathematics in a PLC at Work™, Grades 6–8* gives teachers the tools to effectively offer mathematics instruction and address the Common Core State Standards (CCSS) for mathematics challenge: *All students successfully learning rigorous standards for college or career-preparatory mathematics.*

This guide is arranged by chapter, enabling readers to either work their way through the entire book or to focus on the specific topics addressed in a particular chapter. It is best used in collaborative teams, but can also be used by individuals and small groups, to identify key points, raise questions for consideration, assess conditions in a particular school or district, and suggest steps that might be taken to implement the CCSS in a PLC culture.

Common Core Mathematics in a PLC at Work™, Grades 6–8—Study Guide

We thank you for your interest in this book, and we hope this guide is a useful tool in your efforts to create healthy culture in your school or district.

Chapter 1

Using High-Performing Collaborative Teams for Mathematics

1. Read the descriptors from the “seven stages of teacher collaboration diagnostic tool” provided in table 1.1 (page 13). Then, rank each of the middle school teams you serve on, in terms of progress toward stages six and seven of teacher collaboration. If one or more of your teams are not yet at stage six or seven, identify actions each team can take in order to move forward into the next stage of collaboration.
2. Does your collaborative team ensure you have the collaborative time necessary to work effectively on unit-by-unit mathematics instruction and assessment? We recommend meeting at least once per week around an organized and efficient agenda. If this is problematic, how might you discuss the issue with your middle school principal?
3. Every effective middle school collaborative team “knows who is driving the bus” of the team meeting. Who is your current team leader? How does the team leader help (or not help) to facilitate the work of the team? What else can your team leader do to support the group’s work?
4. Examine your team meeting agendas and minutes. Are your meetings efficient? Are they effective? Are they a good use of your time? What are ways that your team can improve the quality of your team norms and the overall team-meeting experience? How does your team currently take advantage of electronic file sharing for the work it

produces? Are all of the team's artifacts easily accessible for examination, improvement, and analysis by the team?

5. Figure 1.6 (pages 21–22) suggests ten high-leverage, high-inquiry mathematics team practices and actions. Select two of the practices that you don't believe are currently consistently present in your instruction or assessment. Develop an action plan to focus on implementation of those two practices.

Chapter 2

Implementing the Common Core Standards for Mathematical Practice

1. Select one of the eight Standards for Mathematical Practice (see appendix A, page 181). What are three student behaviors that you believe would illustrate a student engaged in this practice. What teacher actions are necessary to engage students in the expected behaviors?
2. Examine the perseverance aspect of Mathematical Practice 1, *Make sense of problems and persevere in solving them*, as highlighted on pages 33–37. As a team, reflect on the degree to which you each support students with the notion of *productive struggle*. How do you do this to encourage students' continued engagement with various mathematical tasks? What specific action steps can you take to develop student perseverance over time in your classroom and meet the expectations for problem solving described in figure 2.3 (page 35)?
3. Students' perseverance in problem solving is also affected by their beliefs about their own intelligence. Read a summary of Carol Dweck's research about students' mindsets about their intelligence (see www.mindsetonline.com/whatisit/about/index.html). One research finding is that the nature of teacher praise—whether it refers to students' intelligence or effort affects students' mindsets. Consider these examples of teacher praise: “Great answer. You're really smart.” versus “Great answer. I can see you

worked very hard on this problem.” What type of feedback do you and members of your collaborative team give to students? Is it promoting growth or fixed mindsets about their intelligence? How can you change the feedback that you provide to promote students’ development of growth mindsets?

4. Examine the teacher actions that help to develop Mathematical Practice 3, *Construct viable arguments and critique the reasoning of others* (see pages 44–46). Discuss in your collaborative team the degree to which you believe your classroom currently has the social norms required to effectively engage students in this mathematical practice. What action steps will you take to create the necessary environment described in the bullet points on page 44?
5. Examine and discuss the “Elements of an effective middle school mathematics classroom lesson design” in table 2.2 (pages 59–61). How will your team ensure the student learning experience as described in part two of lesson process (pages 60–61)? Examine part four on homework (page 61). Consider how you will provide unit-by-unit homework assignments that are aligned to the unit standards and that all students of the course could use?
6. Use the “CCSS Mathematical Practices lesson-planning tool” in figure 2.16 (page 69) to collaboratively design a lesson on engaging students in one of the Standards for Mathematical Practice and making use of a high-cognitive-demand task as described in table 2.1 (page 37). Plan to observe one another implement the lesson. As a team, reflect on the lesson’s effectiveness and make revisions to the lesson as needed.

Chapter 3

Implementing the Common Core Mathematics Content in Your Curriculum

1. Discuss with your collaborative team what you believe is the biggest content challenge for you in the grades 6–8 Common Core content standards for mathematics. Is the challenge:
 - The focused emphasis on Ratios and Proportional Relationships (RP) in grades 6 and 7, including the emphasis on unit rates, scale factors, and constants of proportionality and de-emphasis on cross multiplication?
 - The introduction of transformational Geometry (G)?
 - The developmental work with Functions (F) in grade 8?
 - The increased focus on linear equations for all eighth-grade students?
 - The deep treatment of Statistics and Probability (SP) in grades 6 and 7?
 - The need to understand the progression of these topics across all three grade levels of middle school?
2. Select a content standard cluster from the Statistics and Probability (SP) domain (see appendix B, page 191; appendix C, page 198; and appendix D, page 206). Discuss the Standards for Mathematical Practice that you can engage students in, and how you might do so, as they learn the standards in the chosen content standard cluster.

3. Complete table 3.6 (page 100) for each eighth-grade content standard cluster in the Expressions and Equations (8.EE) domain. Then do the same activity for grades 6 and 7 (see appendix B, page 189, and appendix C, page 196). What does this activity reveal about the important content shifts your team will need to make?

4. Examine the description of “collaborative planning for pacing instruction” on page 117. Use the model from figure 3.14 (page 118) to create a calendar (or do an analysis of your current calendar) for your next unit. Does your unit plan allow you to:
 - Identify and use common high-cognitive-demand instructional tasks?

 - Determine common formative assessments questions and instruments to be used during the unit?

 - Provide adequate time for distributed student practice and engagement?

Chapter 4

Implementing the Teaching-Assessing-Learning Cycle

1. How do you currently try to collaboratively design and score common unit-by-unit assessments within your team? How do you ensure the use of high-quality assessments and the scoring of those assessments? Why is agreement in this practice so critical? How do you currently evaluate the quality of any assessment tool the team uses for the course (see figure 4.6, page 138)? What action steps do you need to take in order to collaboratively develop critical and necessary *before and during the unit* assessment instruments and practices (see step one of the teaching-assessing-learning cycle in figure 4.1, page 131)?
2. Discuss as a collaborative team your current assessment practices. Do all of your current assessment instruments (tests and quizzes) primarily serve a formative function (or are they used merely to assign grades—a diagnostic only function)? If they do not serve a formative function, what action steps will you take as a team to change your current assessment practices to ensure assessment is the means to the end of learning, and not the end to student learning (see step four of the teaching-assessing-learning cycle in figure 4.1, page 131)?
3. Consider the feedback you provide students after they complete an assessment instrument such as a quiz or test. Do you and team members provide all students

accurate, fair, specific, and timely feedback? How do you know? If not, what action steps will you take to change this practice? How could you use a student goal-setting tool like the one provided in figure 4.8 (page 143) as part of a step four response in the teaching-assessing-learning cycle?

4. Do all members of your team provide students multiple opportunities to demonstrate their knowledge? That is, do students have the opportunity to be reassessed and improve their grade before the end of the grading period? If not, what actions steps will you take to implement this practice? How can you make this an efficient process for you and a motivational assessment process for your students by using the re-engagement lesson process described in table 4.1 (page 146)?
5. As a collaborative team discuss the quality of your current grading practices. For example, do you use mean scores or allow the use of zeros? Do you allow makeup work and extra credit? Discuss the advantages and disadvantages of each approach. Do all members of your team use the same approach to determine students' grades? If not, what action steps will you take to develop coherence and consistency? As a team ask and answer the eight questions from figure 4.10 (page 150).

Chapter 5

Implementing Required Response to Intervention

1. Discuss as a collaborative team the sources that inform equity in mathematics education. Read the equity reflection questions from figure 5.1 (page 158) and then complete the Equity Reflection Activity in table 5.1 (pages 158–159). What does this activity reveal about your current practices?
2. Does your team have dedicated time allocated to provide students with Tier 2 (see pages 173–174) intervention and support as needed? Is this intervention required, coherent, and consistent for all students of the course? If not, how can you find the time in your schedule?
3. If your course currently offers tiered intervention support for students who require it, what is the instructional focus of the intervention? Specifically, does the intervention seek to teach for depth of understanding for all students, or is it narrowly focused on computational skills? If the intervention is not balanced in its approach, what action steps can you take to broaden its instructional goals? For guidance in your responses, see table 5.2 (pages 161–162) and figure 5.3 (pages 166–167).
4. As a collaborative team, discuss how your current unit-by-unit instruction and assessments address the needs of students with minimal English language or literacy skills (see page 175).