Chapter 3

The Common Core Mathematics Debate

An excellent mathematics program includes curriculum that develops important mathematics along coherent learning progressions and develops connections among areas of mathematical study and between mathematics and the real world.

—NCTM

This chapter will help you better understand and speak to the original intent, hope, and promise of the Common Core as well as the arguments against them. As you read through these issues, ask yourself, "How will or does this affect the students in my class or my school, the current high school graduates in my district, or any graduating class moving forward? What is the truth about the expectations of the revised mathematics standards?"

If you are an elementary educator, students' parents might have expressed concern about the nature of homework labeled *Common Core.* This chapter will help you better understand the intent of the Common Core, gain insight into the arguments some parents and politicians make against the Common Core, equip you to discuss those issues and concerns with parents, and help you determine if elementary-level math homework really has anything to do with the actual content standards of the Common Core. (See Issue 3: Challenges of Authentic Implementation, page 50, for more insight.)

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Reflections for Parents

Some of you may have children born in 2010, or perhaps these children live on your street or in your neighborhood. In all likelihood, they will be the first class of students to receive a K–12 education built on a foundation of mathematics standards influenced by the Common Core—a call for a balanced student learning experience. Is this a good or a bad outcome for your child? Will it better prepare your child (and all of those who come before and after) for college and career readiness after high school? What have your friends and neighbors said about the expectations of the Common Core? This chapter will help you better understand the difference between the Common Core as a set of state designed standards *and* the Common Core as a testing process for those state standards.

Support for the CCSS for Mathematics

It was April 2009 when the Council of Chief State School Officers (CCSSO; composed of State Department of Education leaders) and the National Governors Association Center for Best Practices advocated for and sponsored the development of a common set of mathematics content standards for K–12 students in the United States. They were aiming to improve opportunities for students learning now and in the future.

The goal was to ensure all students leave high school prepared for college and career. Published in June of 2010, these standards became known as the CCSS for mathematics, or simply the Common Core (NGA & CCSSO, 2010). (The NGA and CCSSO also released standards for English language arts at this time.) Visit the Common Core's website (www.corestandards.org) to download and read more about the standards.

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The political response to the birth of these K–12 standards was a relatively uncontroversial endeavor and a bipartisan initiative (Supovitz, Daly, & del Fresno, n.d.). Both democrat and republican governors supported the standards. Some governors who opposed the Common Core later originally supported the standards (Kertscher, 2015; Layton, 2015; & Qiu, 2015). Eventually, forty-five

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states and the District of Columbia adopted the *voluntary* mathematics standards. And states like Alaska, Texas, Minnesota, Nebraska, and Virginia developed their own state standards that reflected some of the best elements of the CCSS for mathematics.

The future looked promising for improving student learning in mathematics not only for those born in 2010 but also for the class of 2015 and beyond. There was great hope and enthusiasm that learning expectations for mathematics would and could be raised and equalized—that students from Mississippi to Massachusetts would learn both more mathematics and essentially the same mathematics.

Why did the states' governors and chief state school leaders feel compelled to commission the writing of these standards? Partially because as the 21st century opened, some politicians and educators became increasingly aware that the patchwork quilt of various state standards, expectations, and tests resulted in vastly different learning outcomes for students (see chapter 1). The quality of education wasn't just about being born in 2010. It was more about the zip code in which you were born. This is a harsh reality in the United States. Contrary to the rhetoric, the United States is not a country of equal education outcomes or even opportunities (Schmidt, Cogan, Houang, & McKnight, 2011).

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Students were learning different amounts of mathematics at different levels of proficiency based on little more than where they lived because each state determined its own standards. How much education a student attains and how much mathematics a student learns in grades K–12 has significant implications for his or her career and economic growth opportunities in society (Autor, 2014; Carnevale et al., 2015; NRC, 2012a). Consequently, this should be a major concern for every parent.

Objections to the CCSS for Mathematics

In 2015, as the high school class of 2028 prepared to enter kindergarten, the same Common Core that enjoyed near universal support from teachers, education leaders, politicians, and even many parents

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just two years prior were suddenly under assault from a variety of directions. Why? Social historians will eventually analyze what happened and offer various theories.

We briefly point out why we believe some support was lost and illustrate what has never been a serious point of opposition to the CCSS for mathematics: *the content and process standards themselves*—the statements of what students should know and be able to *do* with mathematics. The motivation for opposing the Common Core is different for different individuals and groups.

Issue 1: Mistaken Belief That the Common Core Is a Federal Initiative

The federal government attached Race to the Top funds (see www2.ed.gov/programs/racetothetop/index.html for additional information) to state adoption of college- and career-ready standards, which led to this mistaken perception. Grant applicants, at either the state or district level, widely interpreted this grant requirement as the federal government's effort to "force" adoption of the CCSS. In reality, all states had to do was adopt college- and career-ready standards. States never were specifically required to adopt the Common Core, although adopting it was perhaps the most efficient way to demonstrate that local standards were college and career ready.

Education in the United States has always been a state, and even more specifically, a local issue. Therefore, some people objected to the Common Core because they saw it as federal intrusion on states' rights, despite the fact that the states' governors and chief state school leaders commissioned the CCSS back in 2009. In reality, the Common Core movement originated at the state level and was directed at the state level—the very states that have constitutional authority for education in the United States.

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Issue 2: Confusion Between Standards and State Testing of Standards

Ever since NCLB passed in 2001, states have been required to annually test students in grades 3 through 8 and in one grade in high school. Federal support of

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education is not a new phenomenon. The most significant federal legislation affecting education was and remains the ESEA of 1965 (PL 89-10). This legislation sought to narrow achievement gaps by providing resources to support instructional materials and professional development for educators. The federal government intended to reauthorize ESEA every five years, but NCLB remained the version of the ESEA through the 2015–2016 school year. ESEA was reauthorized, beginning with the 2016–2017 school year, as the Every Student Succeeds Act of 2015 (P.L. 114-95).

NCLB supported standards-based reform, assessment, and establishing measurable goals—a requirement that disaggregated groups of students make adequate yearly progress in mathematics and reading. President George W. Bush proposed NCLB, and both democrats and republicans sponsored it. Both houses of Congress passed it overwhelmingly.

Under the guidelines of NCLB, each state was required to develop its own test and its own passing score (definition of proficiency) for grades 3–8 and high school. This resulted in little consistency in expectations across states and an incoherent system of fifty different sets of standards, with fifty different tests of mathematics proficiency, and fifty different passing scores. If a student was declared proficient in mathematics in one state, he or she might or might not be proficient in another state—it was simply impossible to tell (Fuller, Wright, Gesicki, & Kang, 2007).

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They intended to develop common tests of mathematics proficiency so student achievement could be compared from state to state. In 2010, the U.S. Department of Education awarded more than $330 million in Race to the Top funds to two consortia, at the time representing the majority of states, to develop assessments aligned with the CCSS that would replace the various

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state tests. Initially, more than thirty states belonged to one or both of the consortia. However, beginning in 2015, some states began to withdraw from the assessment consortia, and once again began to design their own assessments.

The states that represented the SMARTER Balanced Assessment Consortium (SBAC) received $160 million, and the states that represented the Partnership for Assessment of Readiness for College and Careers (PARCC) received $176 million to design improved tests (Porter, McMaken, Hwang, & Yang, 2011). The first testing occurred in the spring of 2015. As the assessments are being administered and results are announced, what is most likely to happen to the standards and the new assessments by 2020? By 2025?

First, these Common Core state assessments (SBAC, PARCC, or a new state-based assessment) are radically different from the state assessments that preceded them. The design specifications for these tests, and the released sample items, assess students' abilities to engage in higher-order thinking, reasoning and conceptual understanding, and problem solving.

Previously, state assessments under NCLB assessed basic skills in isolation at a low-level depth of knowledge (Herman & Linn, 2013). The new tests are delivered in a modern-day digital medium, which means online with a mix of constructed-response items (students must provide the answer, not choose from multiple-choice answers), performance-based tasks (problems that require extended solutions), and computer-enhanced items that require the application of knowledge and skills. It's important to note that the nature of all testing for college and career readiness pursuits, as well as much of the technical diagnostic work done in schools, is now administered in an online environment.

In most cases, initial implementation of these new forms of student assessment occurred in the spring of 2015, as a growing grassroots movement against testing in general emerged in the United States. This so-called "opt-out" movement includes a very small but vocal group of parents who refuse to allow their children to take the new assessments.

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Parents and some education leaders began to express legitimate concerns related to testing, including the following (Larson & Leinwand, 2013c).

- The amount of time devoted to testing in schools at the expense of instruction
- The cost of testing, exacerbated by the infrastructure requirements of online administration of the new tests
- Data collection and privacy concerns related to the use and storage of student results
- The use of assessment results to evaluate teachers, especially when the tests were widely acknowledged to be more rigorous and likely to result in lower test scores

In October 2015, the Obama administration acknowledged the United States' overemphasis on standardized testing and recommended that standardized testing be capped at 2 percent of students' classroom time, while simultaneously reinforcing the point that appropriate assessment is an important instructional tool (Lederman & Kerr, 2015). These recommendations hold the promise to address some of the concerns of the opt-out movement. State and national consortia tests must be continually revised and improved if there is to be effective growth and development in standards assessment. The important point is that efficiency and implementation concerns directed at the *assessment* of the CCSS should not be confused with the value of the K–12 mathematics *content* of the Common Core standards initiative.

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Assessing what a student *has* learned (How will we know if students have mastered the standards?) is a distinct matter and process from what each student *should* learn (What do we want every student to know and be able to do?) in mathematics at each grade level. Every child has the right to be college and career ready when he or she leaves high school.

As we will explain in chapter 4, assessment at the local and state levels is a critical part of an effective K–12 mathematics program. As

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highly respected U.S. mathematics educators Mark Hoover Thames and Deborah Ball (2013) write: "If the country is to make progress on improving mathematics education, then the all-too-common aversion to assessment among professional educators . . . is untenable. Testing (in some form) is critical to education" (p. 37).

We would add students' families to the list of those who should not be averse to embracing the role assessment plays in improving instruction and student learning.

Reflections for Parents

A medical analogy is useful to illustrate the value of assessment to instruction. When a person goes to his or her physician with a medical concern, the first thing the physician typically does is conduct an assessment, which often includes ordering a test (for example, a blood test, an X-ray, or perhaps a CT scan) in order to diagnose the problem and determine the most effective treatment. Assessment in education diagnoses student learning needs and directs effective instruction to respond to those needs just as medical tests diagnose illness and direct effective treatment protocols. Opting out of assessment that reflects student learning is the equivalent of opting out of potentially life-saving medical tests.

Issue 3: Challenges of Authentic Implementation

Teaching the revised mathematics standards requires professional development and support to make the transition to these new, more rigorous standards. As a result, some teachers are still in the process of learning how to interpret the content standards; use research-affirmed, highly effective instructional strategies (see chapter 4); and increase their own mathematical knowledge for teaching more rigorous content standards. In an era of viral social media reactions (see issue 4, page 52), parents and many others began to circulate and decry what they saw as confusing and needlessly complicated instruction and homework.

A fairly famous example of frustrating homework mistakenly credited to the Common Core standards came from parent Jeff Severt (Heitin, 2014). In early spring 2014, Severt posted a page from his second-grade son's Common Core homework on Facebook. The assignment required

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his son to determine where a fictional student named Jack went wrong when computing 427 minus 316.

Severt, who has a bachelor's degree in engineering, completed his son's homework using the traditional algorithm in under five seconds. He objected to Jack's approach of using a number line and skip-counting backward to solve the equation—an overly complex approach to the problem, from his perspective. The assignment asked students to write a letter to Jack explaining what he should do to fix his mistake. Severt completed his son's letter to Jack, telling Jack that he shouldn't feel bad about his mistake because he himself has a degree in electronics engineering, has completed extensive college-level mathematics courses, and that despite his mathematical background, even he couldn't explain Common Core mathematics. This concern is nearly identical to that Shackelford expressed half a century earlier with respect to new math (see chapter 2, page 27). Severt signed the letter *Frustrated Parent*. His Facebook post went viral, and conservative talk show host Glenn Beck interviewed him on his television program (Atler, 2014).

Bill McCallum, one of the lead writers commissioned by the states' governors for the development of the CCSS for mathematics, reported that the problem was not a Common Core problem but a product of poorly designed curriculum. The Common Core actually requires fluency in the skills of adding and subtracting using the same strategy Severt used to solve the problem (Garland, 2014).

However, some parents reached the conclusion that what they perceived as senseless and unnecessarily convoluted instruction and homework was a result of Common Core implementation. The often repeated mantra was, "If we hadn't adopted the Common Core, we wouldn't have to suffer from this confusing and senseless homework." Is this something you have heard as well? Have you heard people equate "confusing instruction" and "confusing homework" with "Common Core instruction and homework"? This could not be further from the truth.

It is worth noting that the writers of the CCSS for mathematics (and English language arts) specifically state, "These standards do not dictate curriculum or teaching methods" (NGA & CCSSO, 2010, p. 5). Unfortunately, this critical yet very subtle statement from the CCSS initiative document never went viral.

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Nearly all the instructional and homework tasks or examples that rightly frustrate parents are not examples of what is necessary for every student to know and be able to do at each grade level or course (in other words, these examples do not exemplify the CCSS initiative). Instead, they are often examples, tasks, or methods of ineffective instruction; they represent a poor interpretation of the curriculum and the standards; or they represent instructional strategies used to develop student understanding of underlying mathematical concepts. However, they aren't the end goal of instruction. It is critical not to confuse instructional strategies intended to build understanding with end goals that include proficiency with standard or traditional approaches. (We describe effective instruction in chapter 4.)

In general, when frustration sets in for students, parents, or teachers, there is a tendency to want to place blame and find a scapegoat. The Common Core became a bogeyman for every concern anyone had about mathematics education. With respect to most of these concerns, the bogeyman existed prior to 2010, but now he had a new, high-profile identity.

How can we claim in the United States—which prides itself on equality of opportunity—that a college- and career-ready K–12 curriculum is not for every student?

All too often, the reaction to this criticism is to lower the bar of expectations. It would be easier in some ways not to expect too much of our students, our educators, and ourselves. Yet, how can we choose to lower the bar for what every student should know and be able to do? How can we claim in the United States—which prides itself on equality of opportunity—that a college- and career-ready K–12 curriculum is not for every student?

Implementation frustrations aside, the CCSS, if effectively interpreted and implemented, are a source of great promise and hope—not something to blame for every frustration someone has regarding school.

Issue 4: Social Media—Opinion Versus Evidence

The news media, in general, does not often cite research or rely on experts when offering stories on education (Henig, 2008). And yet, the news media can and does significantly influence people's perceptions of issues (Yettick, 2015). Social media has amplified this effect. The

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Internet has changed our lives. It is now possible to do our own research and ultimately become "experts" ourselves. However, we must keep this caution in the back of our minds (Pariser, 2011). As an article in *National Geographic* points out, the "Internet has democratized information, which is a good thing. But along with cable TV, it has made it possible to live in a 'filter bubble' that lets in only the information with which you already agree" (Achenbach, 2015, p. 45).

People who have concerns about the Common Core or the testing of those standards, based on their own experiences, can quickly find an entire social network of like-minded individuals with whom they could share examples of ineffective instruction and curriculum and virally spread misinformation within an increasingly loud echo chamber (Castillo, Mendoza, & Poblete, 2011; Roodhouse, 2009). The same could be said for those who support the standards.

Social networks, such as Facebook and Twitter, often fan the fires of the debate over the Common Core and give voice to grassroots critics in unprecedented ways. Jonathan Supovitz, Alan Daly, and Miguel del Fresno's (n.d.) extensive study on the impact of social media on the Common Core debate analyzes nearly 190,000 tweets made between September 2013 and March 2014 using the hashtag #commoncore. Their research is fascinating. We highlight some of their findings here.

- The elite transmitters (the individuals who sent out the most tweets) are overwhelmingly against the Common Core (by a margin of more than four to one).
- The most frequently mentioned education topic with the hashtag #commoncore is *testing*. (See issue 2 on page 46.)
- Those supporting the Common Core tend to form their arguments using logical reasoning and facts.
- Those who opposed the Common Core tend to use more visceral language, appeal to people's passions, and utilize powerful metaphors. See, for example, "Common Core as a Threat to Freedom" (Supovitz et al., n.d., p. 53) and "Common Core as a Source of Psychological Harm" (Supovitz et al., n.d., p. 52).

Social media is a powerful force in generating and inflaming opposition to the CCSS initiative, while reinforcing the misinformation outlined in issues 1 through 3.

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Reflections for Parents

We recommend trying to ignore anyone speaking in extremes about the mathematics your child is learning, not offering constructive suggestions for improvement, or not providing evidence to support his or her claims. Challenge your friends and colleagues to actually read the CCSS for mathematics (www.corestandards.org). We encourage you to consult the literature we cite if you want more information. Seek to understand the CCSS for mathematics from an informed point of view based on evidence and not simply someone's opinion—an opinion that may or may not be steeped in the actual facts and evidence. We encourage you to understand issues based on the evidence, and leave the rhetoric to talk show hosts. As Douglas Reeves (2011) points out, "Discussions in education often remain stubbornly focused on experience instead of evidence. . . . Rhetorical certitude, however, is not a substitute for evidence" (p. 5).

What Few Seem to Oppose: Good Standards

We offer these four issues for objection to the CCSS in order to shine a bright light on the following: *Not one of the four issues has anything to do with the K–12 mathematics content of the state standards themselves.*

For example, no one seriously argues that the third-grade treatment of fractions in the Common Core is misguided or that the developmental progression of fractions in grades 3–5 is inappropriate. There is actually very strong agreement on *what we want every student to know and be able to do* (Munter, Stein, & Smith, 2015), but too often that is masked behind a smoke screen of unrelated issues and concerns.

In a fascinating paradox, the CCSS for mathematics often calls for student learning that is the exact opposite of what is attributed to the initiative (for mathematics) and posted on social media. Contrary to what often appears on Facebook and Twitter, the Common Core *does* call for students to learn how to add, subtract, multiply, and divide with whole numbers, integers (positive and negative numbers with no fractional part), and rationals (fractions), and to ultimately do so with traditional algorithms—the way you learned it when you were in school!

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Consider an example from the CCSS for mathematics for fifth grade, standard NBT.5: "Fluently multiply multidigit whole numbers using the standard algorithm" (NGA & CCSSO, 2010). Multiply with the *standard algorithm*! Are you surprised? Figure 3.1 illustrates the traditional algorithm for multiplication you likely learned when you were in school.

$$\begin{array}{r} {\scriptstyle 2\!\!\not{7}} \\ 43 \\ \times\ 17 \\ \hline 301 \\ +\ 430 \\ \hline 731 \end{array}$$

Figure 3.1: Traditional algorithm for multiplication.

While reasonable experts might and do debate the placement of specific topics in certain grade levels in the Common Core, the majority of serious scholarly reviews (a greater level of confidence than just our opinions) find that the CCSS for mathematics are more rigorous, focused, and coherent than the vast majority of state standards that preceded them (Porter et al., 2011; Schmidt & Houang, 2012).

The hope and the promise of the mathematics standards is that those students will graduate from high school better prepared for a post–high school world that demands greater levels of reasoning and understanding than ever before. The hope is that they will demonstrate exceptional procedural fluency, conceptual understanding, and problem-solving ability, and graduate college and career ready with unprecedented opportunities open to them. It appears that is exactly what is happening.

According to Paul Peterson, Samuel Barrows, and Thomas Gift (2016), the CCSS have served as a catalyst to significantly improve student proficiency in mathematics and reading. They claim, "Most states set only mediocre standards for the first 10 years of NCLB. Since 2011, 45 states have raised their standards for proficiency in reading and math based on comparing state and NAEP expectations. The greatest gains occurred between 2013 and 2015" (p. 2).

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In their summer 2015 *Education Next* report "States Raise Proficiency Standards in Math and Reading," Paul Peterson and Matthew Ackerman write that twenty-four of forty-nine states earned an A grade for raising the bar of expected proficiencies for every grade level. To read the full report, go to http://educationnext.org/after-common-core-states-set-rigorous-standards/, and see the grade your state received.

In the next chapter, our focus turns to parents and their role in their children's mathematics education. We will more fully define what constitutes an equilibrium position in mathematics education and answer the question, What should students' learning experiences in mathematics look like in the classroom (and at home)?

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