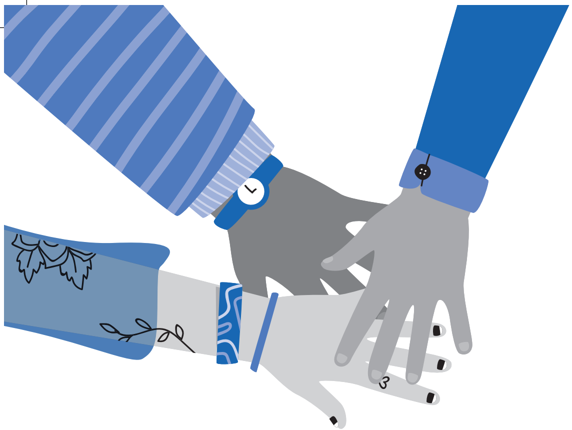


1

JUMPING ON BOARD

What Is the Mathematics Whole School Agreement?

Have you ever walked through classrooms in your school and looked at the items on the wall related to mathematics? Give it a try sometime, and consider what is similar and what is different across classrooms. What do you notice and wonder about? Perhaps you'll see a "Steps to Problem Solving" poster in your neighboring fourth-grade class and notice that they are using different steps from those in the poster in your classroom. Or maybe you'll see that two different first-grade classrooms have displays of possible mathematics thinking strategies on the wall but they don't match. You may see math word walls with completely different names for mathematical properties or algorithms. What, you wonder, will happen when those children move into second grade next year but their prior mathematical knowledge is substantially different? What confusion will ensue? How will the next year's teacher cope? What if that teacher is you? Or what if your job is to coach and support that teacher?

This book is designed to keep you, your colleagues, and your students away from this unfortunate, but all too common, situation.

In this chapter you will learn

- What a Mathematics Whole School Agreement is
- Why students need a cohesive mathematics instructional experience
- How equitable and high-quality instruction is at the foundation of the process

WHAT IS THE MATHEMATICS WHOLE SCHOOL AGREEMENT?

Mathematics Whole School Agreement: A unified and consistent approach to mathematical language, notation, representations, rules, and generalizations.

In this book we argue for the idea of building a Mathematics Whole School Agreement (MWSA). This initiative refers to a unified and consistent approach to preferred and precise mathematical language, notation, representations, rules, and generalizations that will help clarify rather than muddy children's mathematics understanding and increase their chances of mathematical success as they move into middle grades, high school, and beyond. In this book, we describe the need for an MWSA; we discuss what the agreement entails, including some very concrete mathematical don'ts and dos; and we share ideas about how to go about establishing and building the coordination and buy-in needed from educators and stakeholders to enact, implement, and get the best results from the MWSA.

So why the MWSA, and why now? *Catalyzing Change in Early Childhood and Elementary Mathematics: Initiating Critical Conversations* (National Council of Teachers of Mathematics [NCTM], 2020) describes the need to broaden the purposes of learning mathematics and articulates three key purposes for learning mathematics in the early years:

- Develop deep mathematical understanding as confident and capable learners
- Understand and critique the world through mathematics
- Experience the wonder, joy, and beauty of mathematics (p. 11)

These three purposes of learning mathematics embody the essence of the mathematical learning experiences we most want for our students—all of our students. They empower students as mathematical thinkers and doers, and they prepare students with the mathematical literacy needed for their professional and personal lives (NCTM, 2020). An MWSA builds the instructional foundation needed for these key purposes of learning mathematics to be realized in a way that is consistent, coherent, systemic, and systematic within grades, across the school, and, more broadly, within a district, state, or province. Establishing an MWSA ensures that each and every student has access to mathematically sound, consistent, high-quality learning experiences. What might happen if we don't establish an MWSA? Let's peek into a classroom:

A third-grade teacher, Ms. Jackson, is engaging her students in several problems about multiplication situations using an equal-sized group model. The first problem asks the students to think about how many children could fit in the school library if there were four tables with three children at each table. The second problem asks the students to think about how many children could fit in the same library if there were three tables with four children at each table.

Ms. Jackson's students are familiar with this problem type and select manipulatives from a central basket on the table, with most children choosing two-colored counters to represent the children and paper plates to represent the library tables. During small-group work time, this conversation occurs:

> **Robin:** I'm looking at these equations we wrote ($4 \times 3 = 12$ and $3 \times 4 = 12$), and I think this is the flip-flop property.
>
> **Ms. Jackson:** I'm not sure of the flip-flop property; can you tell me more?
>
> **Robin:** It's what we had in first grade. You can flip the numbers.
>
> **Jorge:** Oh I know that one; my teacher last year called that the commuter property! She said commuters go back and forth to work and the numbers go back and forth.
>
> **Ms. Jackson:** Robin, can you show me how the flip-flop property works with an example?
>
> **Robin:** Sure, $2 + 3 = 5$ and $3 + 2 = 5$. You can flip them or flop them, and you get the same answer.
>
> **Ms. Jackson:** Jorge, what about you? Can you give me an example?
>
> **Jorge:** Yes. It's like Robin said. If you have four children at three tables and switch them back and forth, like a commuter, you can also put three children at four tables. See? [*He rearranges his counters once and then back again*.] I know this because my dad commutes, so he goes back and forth.
>
> **Ms. Jackson:** I see. I think you are both talking about the commutative property. You are right in thinking there is something similar happening here with multiplication as there was with addition. Let's put "Commutative Property" on our math word wall with the equations you pointed out, Robin, so we can all use it when we notice this property appearing at other times during mathematics class.

This may seem like an extreme or even trivial example, but the dialogue from Ms. Jackson's class happens when students have at some point engaged in mathematics instruction where they are taught in ways that are inconsistent with what other teachers are using, are not well matched to the curriculum or standards, do not represent appropriate mathematical terminology, or suggest rules that later expire or fall apart. Have you ever seen this? The problem is that when consistent and appropriate mathematical language is not intentionally used, there is no evidence of vertical coherence.

Vertical coherence: The act of ensuring that interrelated mathematics concepts are aligned across grades.

Horizontal coherence: Being mindful of the relationship among mathematics concepts at the same grade.

That is, in successive grade levels, teachers and other students do not have a shared vocabulary or a shared understanding of how and when imprecise words are used. Even when the same curriculum and standards are used schoolwide, without intentional planning about what will be taught and how, the outcomes can be disjointed and students can become confused. Students begin to feel as though they're constantly learning something new and different. The irony is that while many schools work hard to enforce a unified approach to other educational matters across the school, the same is rarely true of mathematics instruction. Take classroom management, for example, where there are set guidelines for how students are expected to behave in classroom and schoolwide situations. School leaders and teachers wouldn't think to allow such inconsistency. Instead, they set out rules and norms for movement around the room or hallways between periods, when conversation is permitted, how to ask for help when you are not sure what you should do, and how to participate in discussions. These are agreed-on expectations that are consistent schoolwide. But we need to ask ourselves why there shouldn't be a similarly consistent agreement in place for teaching content. How much do discrepancies—and in some cases outright contradictions—in the way we teach mathematics and the words we use (e.g., *flip-flop property*) get in the way of having a coherent, high-quality mathematics program? How does this confuse and harm rather than help our children in their mathematical learning and achievement? How can we do better by our kids?

WHY STUDENTS NEED A COHESIVE APPROACH TO INSTRUCTION

The consistency of a message is important. We all know the feeling of having different people tell us different ways in which we need to do something and finding that hard to negotiate or navigate. Multiple communications to students with conflicting language and notation, representations, and rules and conventions in mathematics can cause mental conflict and stress for adults and children alike. This perpetuates the negative stereotypes about mathematics we hear so often: It isn't relevant to students' lives outside school; it's boring; it requires a "math brain"; it consists of a set of "disconnected ideas." To build a cohesive approach, we want to "maximize strategies that promote positive emotion" and diminish stress or threats that impede learning (Hardiman, 2011, n.p.). Research on brain-targeted teaching helps us understand how students sort the information they receive into whether those new pieces of data relate to prior experiences or knowledge

(Hardiman, 2012). Then the students build new ideas from there. If the information is in opposition to previous learning, there is a disconnect that can hinder learning or result in a backward step in retention of mathematics understanding. Squire (2004) suggests that how well we remember hinges on rehearsing and restating the ideas we learn as we set them into cohesive and connected long-term systems, constructing one layer of concepts on another. That can't happen if we don't present content in ways that help students find the familiar, identify patterns, and explicitly point out the connections between prior knowledge and new information (Skemp, 1978). Students need these linkages to deeply examine mathematics concepts and analyze situations through inductive problem-solving approaches rather than a strictly deductive model.

Deductive problem-solving: Where there is a presentation of information that students apply to the models they are taught. It is teacher centered.

Inductive problem-solving: Where students experience a more inquiry-based approach. It is learner centered.

HOW DOES AN MWSA PROVIDE A SOLUTION?

The MWSA's design moves away from fragmented approaches and a patchwork of instructional language and notation, representations, rules and conventions, generalizations, and problem-solving approaches across multiple grades to channel an effort toward desired goals and objectives shared by all. It offers the consistency students need because it

- is an agreement shared by *all* stakeholders,
- helps students make sense of the content, and
- helps teachers ensure alignment to the standards and assessments for which they are accountable.

An MWSA Is an Agreement Among *All* Stakeholders

The MWSA is grounded in the idea that students learn mathematics more deeply and successfully when the school has a plan that *all education stakeholders who engage with students* know and follow. All of these stakeholders need to be aware of and ready to implement what educators in the school or district agree on the specific language and notation, representations, rules and conventions, generalizations, and overall problem-solving approaches that every educator in the building or district will use (Karp et al., 2016). This process of reaching an MWSA purposely brings together a broadly defined team of stakeholders that not only includes teachers, instructional coaches, paraprofessionals, and administrators but also involves substitute teachers, volunteers such as grandparents and other local community members, student teachers, staff, all family members, and others involved in students' learning of mathematics. By following an MWSA

CORE MWSA IDEA

An MWSA must involve any and all stakeholders who participate in students' mathematics learning. teaching mathematics in a school is a team sport!

approach, the focus shifts to communicating as a unified whole about the discipline of mathematics and how it is best learned using research-informed practices. Without a clear agreement that is shared by the community as a whole, the result will be that every year the teaching of mathematics becomes harder and harder as students progress up the grades through different teachers and learning becomes more difficult for all students. Let's end this.

An MWSA Helps Students Make Sense of the Content

Some administrators and instructional leaders may say, "But we all have the same curriculum—doesn't that count?" And we respond, "That's a great start." (Later in this chapter we talk about schools that do not have a shared curriculum.) When teachers teach the same mathematics content and practices but use completely different instructional resources, the quality of mathematics instruction students receive will likely vary greatly and there is a strong risk of mathematics not being taught in coherent or consistent ways. This can occur both when teachers have a common curriculum but implement it very differently and when teachers do not have a common curriculum. These disjointed approaches lead to situations such as these:

- Teachers in subsequent grades believing that their students have prior mathematical knowledge that they do not possess
- Students harboring notions of disconnected mathematical relationships with gaps in conceptual continuity
- A general absence of the sense-making we'd like to develop in mathematics, which causes children to become confused and potentially dislike mathematics
- Students developing the feeling that they are not good at mathematics because what they were taught no longer holds true

CORE MWSA IDEA

Curricular coherence isn't about teachers teaching just what they know or sharing a collection of favorite activities!

No well-informed democratic society can afford that! Curricular coherence is about developing a consistent learning pathway in the school; it isn't about teachers teaching just what they know or sharing a collection of favorite activities.

An MWSA Helps Teachers Align Their Teaching With Standards and Assessments

Curriculum is different from, but informed by, the standards adopted in your setting. Although some states have officially adopted the Common Core State Standards in Mathematics (National Governors Association [NGA] Center for Best Practices & Council of Chief State School Officers [CCSSO], 2010), other states use what Opfer et al. (2016) refer to as Standards Adapted From the Common Core, and some others may use different state, provincial, district, or school standards. Regardless of the standards used, there remains much more to consider in an MWSA. In fact, there is little evidence of how standards are connected to what teachers actually do in their classrooms (Opfer et al., 2016). Standards documents themselves state that "standards establish what students need to learn, but do not dictate how teachers should teach. Instead, schools and teachers decide how best to help students acquire the content represented in the standards" (Common Core State Standards Initiative, 2016, n.p.). They go on to say, "Standards are not curricula and do not mandate the use of any particular curricula" (Common Core State Standards Initiative, 2016, n.p.). These statements are helpful because they not only honor teachers' critical function in decision-making but also expose the potential for using instructional approaches that lead to a disjointed collection of lessons. While teachers should feel empowered in determining their mathematics instruction, the effort should be a collaborative one with an emphasis on consistency and alignment. The MWSA requires that you work with your team of schoolwide stakeholders to establish a collective practice and focus on teaching in such a way that standards are implemented with depth and coherence, and the content and associated instructional practices across grades are aligned with attention to vertical or horizontal coherence.

CORE MWSA IDEA

While teachers should feel empowered in determining their mathematics instruction, the effort should be a collaborative one with an emphasis on consistency and alignment.

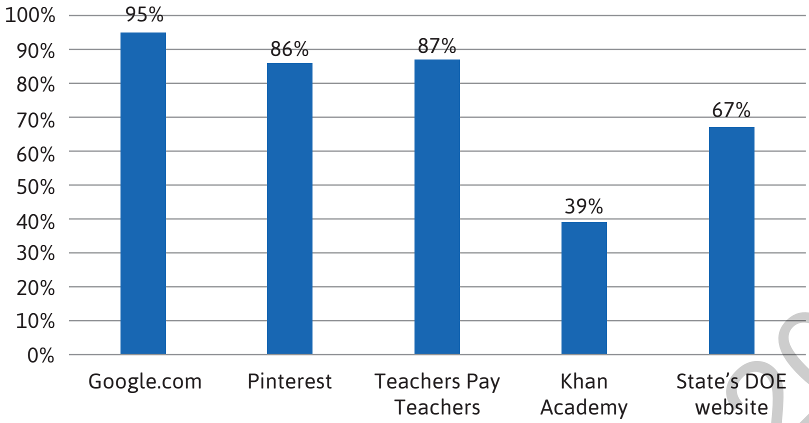
In asking teachers to know the mathematics content deeply and to effectively offer instruction to each and every student, it's important to acknowledge that many teachers are likely being asked to teach topics in ways they may never have experienced as a learner—either when they were in school or through their teacher preparation program. The difference is often more pronounced when we look at the mathematical practices (NGA Center for Best Practices & CCSSO, 2010) or the mathematical processes (NCTM, 2000), or other similar practices or processes adopted by your school, state, or province, because many teachers never experienced these sorts of standards when they were students. This challenge is compounded as some teachers are continuing to use more traditional instructional approaches to teach the rigorous ideas and concepts found in the required standards (Santelises & Dabrowski, 2015), which means that the standards may not be implemented as intended.

Vetted resources: Instructional materials that have gone through a careful examination and rigorous review by an individual with expertise in that area.

We (the authors) know what it is like to seek out curricular materials from near and far to help meet individual students' needs and to supplement content areas that need more attention. But searching for resources in the past often came with the luxury of sources that were well aligned with strong mathematical foundations and tended to be pointed to us via conference presentations, by colleagues who were master teachers of mathematics, or in NCTM journals where these resources and lessons were reviewed. They were often vetted through planning, analysis, implementation, reflection, and revision. In many cases, the experts were well versed in mathematics education and seen as more knowledgeable "others" who had based these resources on research or best practices. The resources were in some, but not all, cases reliably tested in classrooms, with solid results. Now the landscape is different and often involves nonvetted materials that don't always align with research, best practices, or standards. Additionally, the plethora of choices currently available feels like everyone is calling, "Look at what I think, or buy me." Kreisberg (2019) calls this freewheeling situation an "abundance of resources" (p. 1). She points to the enormous array immediately available at the click of a search term. But researchers (Iyengar & Lepper, 2000) suggest that sometimes, when what first appears to be alluring options becomes overwhelming, our decision-making can become seriously affected. This high number of choices can be debilitating when we become "too swamped to make meaning of them" (Kreisberg, 2018, p. 3).

Others are interested in exploring the effects of this smorgasbord of choices of instructional resources—such as researchers. The RAND Corporation has a standing interest in hearing from teachers in their well-known American Teacher Panel, a large group from across the United States whom they consult on a variety of issues. In one of their studies of 2,873 teachers, Opfer and colleagues (2016) found that 99% of elementary teachers said that they use materials "I developed and/or selected myself," and 96% of elementary teachers also reported that they use "materials developed and/or selected by my district." When asked about the use of resources found online, specifically the online resources they consulted most often, elementary teachers reported using, in order of frequency, google.com, Teachers Pay Teachers, Pinterest, their state's Department of Education website, and Khan Academy (see Figure 1.1).

FIGURE 1.1 • MOST POPULAR ONLINE RESOURCES REPORTED BY ELEMENTARY TEACHERS IN THE RAND STUDY

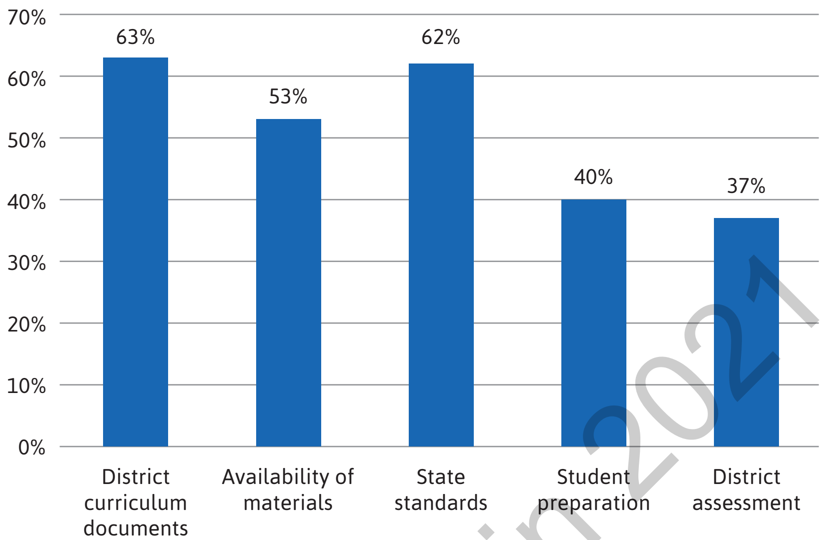


Source: Opfer et al. (2016, p. 39).

Note: DOE, Department of Education.

Interestingly, 57% of elementary teachers were required to use specific instructional materials, 27% said that materials at their school were recommended, and 15% reported having neither required nor recommended instructional materials in mathematics. It is clear from these data that teachers' use of self-selected or self-developed instructional materials is common. Furthermore, teachers reported that the factors that influenced their choices in mathematics instructional materials "a great deal" were district curriculum frameworks, maps, or guidelines; availability of materials; state mathematics standards; preparation of students for the next grade; and district mathematics assessment (see Figure 1.2; Opfer et al., 2016). Not surprisingly, they focused most frequently on the curriculum selected by the district and state standards.

FIGURE 1.2 • FACTORS THAT INFLUENCE TEACHERS' CHOICES IN SELECTING MATHEMATICS MATERIALS



Source: Opfer et al. (2016, p. 45).

When asked if their materials provide opportunities to engage in the use of mathematical language and symbols appropriately when communicating about mathematics, 56% of elementary teachers said "to a great extent" and 49% said that they teach major mathematics topics addressed by the state mathematics standards for their grade level coherently "to a great extent." In a nutshell, this also unfortunately means that 44% of teachers did *not* report using materials that use symbols and language appropriately and more than half of the teachers did *not* agree that they teach grade-level major mathematics topics addressed by state standards in a coherent way "to a great extent" (Opfer et al., 2016). We think you'll agree that this part of the findings isn't good news.

While many schools allow and encourage teachers to self-create or self-curate the curriculum by selecting from a variety of sources, this can result in some schools having different materials used in every classroom, even within the same grade, which isn't optimal. This practice is also not an equitable, coherent, or advisable approach. Please note that we are not talking about the need to address the different learning needs of specific students. We are talking about the core curriculum. Self-curated curriculum can inappropriately create qualitatively different learning experiences for students (as described in NCTM, 2020) and is not a good use of teachers' precious time. It also runs counter to the needed approach of teachers working as a collaborative team, which fosters their professional growth and collectively benefits students. A principal who was leading a middle school in such a situation described it as follows:

> The teachers know their kids well and what the students need to know. But if I look across the mathematics program, it is "hippity skippity." By "hippity skippity" I mean that teachers who don't follow a formal program can tend to be all over the place in their pacing calendar or choice of learning materials. They rely on their own understanding of what to teach and how to teach it, which may not reflect best practices or be grounded in a recommended, research-based learning sequence.

This principal made it a point to verify that all of his teachers are trying their best, but he acknowledged that some individual teachers' decisions about selecting materials had the potential to not align with the direction of the collective group and could be out of kilter with the vertical learning articulation across grades. Selecting materials in a piecemeal way can be chaotic and cause more effort to be put into a freelance approach, with everyone rowing in different directions, than the energy required of an MWSA, where everyone is rowing on a mathematics stream in unison. When many schools are relying on a curriculum in which components are selected or substituted with different replacements by different teachers, there needs to be a decided focus on what is nonnegotiable.

What does your school agree to say and do in the mathematics classroom? This resolution can be laid out in a nonnegotiable, strong, and unified way. For example, even if something that you have decided to avoid appears in a curriculum material, you remain resolute—you collectively won't say it and won't teach it (e.g., *reducing* fractions or a keyword strategy for solving word problems). Let's map out the route to reaching such an agreement.

REFLECTION

LET'S GET MINDFUL

- To what extent are children in your setting receiving the same qualitative mathematics learning experience? For example, to what extent are third-grade students being taught the same mathematical ideas in ways that are coherent and research informed? How are the third-grade teachers coordinating with second- and fourth-grade teachers? Or kindergarten and fifth-grade teachers?
- What are some mathematics instructional absolutes that teachers in your school (or district) must follow in unfaltering ways? What practices (e.g., lecture only, teaching as telling) should be avoided?
- What are some ways to build a cohesive team of stakeholders?

COMMITTING TO EQUITABLE AND HIGH-QUALITY MATHEMATICS INSTRUCTION

An MWSA must be grounded in a schoolwide commitment to equitable and high-quality mathematics instruction. In other words, if attempting to implement an MWSA in a setting where mathematics is taught in a procedure-driven, show-and-tell, lecture format, where there is only one way to get the one right answer, this is neither equitable nor high-quality instruction. A key part and benefit for all educators of the MWSA process is learning more deeply the *what* and *how* of engaging in equitable and high-quality mathematics instruction and embracing a shared commitment to aim for this ideal. Let's break down each element a bit.

Equitable Instruction

Equitable instruction: Classroom practices that ensure that each and every student has equitable access to challenging mathematics learning opportunities.

Equitable instruction includes a commitment to developing students' positive mathematical identities and strengthening their sense of mathematical agency. This means that each and every student is seen as mathematically competent and capable and they are empowered as mathematical thinkers and doers (NCTM, 2020). Aguirre et al. (2013) define a student's mathematical identity as the "dispositions and deeply held beliefs that students develop about their ability to participate and perform effectively in mathematical contexts and to use mathematics in powerful ways" (p. 14). In a classroom in which mathematical authority is shared, students are allowed time to form their ideas and think mathematically; they engage in meaningful discourse, and their contributions are valued (Berry, 2019). Equitable instruction in the elementary grades also attends to the unique needs of young learners while aggressively working to dismantle deficit views and adopt a strengths-based approach (as described in Kobett & Karp, 2020). As simply stated in *Catalyzing Change in Early Childhood and Elementary Mathematics: Initiating Critical Conversations* (NCTM, 2020),

> We must openly challenge deficit labels and the institutional tools and practices that perpetuate static views about children's mathematical abilities and about who is or is not ready to learn. Each and every child is always ready and eager to learn more about their mathematical world. It is the adults that must reexamine their beliefs about readiness and learn to notice and support children's ever-evolving mathematical strengths. (p. 32)

Instructional practices can have both equitable and inequitable outcomes. Inequitable instructional practices will continue to privilege some students while marginalizing others. Establishing an MWSA is part of the hard work that must be done to make things equitable and just. An MWSA ensures that each and every student has foundational access to all of the mathematics opportunities they rightfully deserve.

High-Quality Mathematics Instruction

Planning for high-quality mathematics instruction should be wisely guided by NCTM's (2014a) eight mathematics teaching practices as first described in *Principles to Actions: Ensuring Mathematical Success for All* (see Figure 1.3). The eight mathematics teaching

FIGURE 1.3 • NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS TEACHING PRACTICES

Mathematics teaching practices
Establish mathematics goals to focus learning
Implement tasks that promote reasoning and problem-solving
Use and connect mathematical representations
Facilitate meaningful mathematical discourse
Pose purposeful questions
Build procedural fluency from conceptual understanding
Support productive struggle in learning mathematics
Elicit and use evidence of student thinking

Source: NCTM (2014a). Reprinted with permission from *Principles to actions: Ensuring mathematical success for all*, copyright 2014, by the National Council of Teachers of Mathematics. All rights reserved.

practices inherently represent effective, high-quality, student-centered instruction and should be at the foundation of any mathematics program establishing an MWSA. When these practices are implemented systemically, systematically, and equitably across a school, each and every student can have access to a high-quality mathematics program. To guide professional learning of the eight teaching practices in your school, *Taking Action: Implementing Effective Mathematics Teaching Practices in K–Grade 5* (Huinker & Bill, 2017) provides an in-depth discussion and examples from classrooms for each of the eight teaching practices.

PRIORITIZING THE DEVELOPMENT OF DEEP MATHEMATICAL UNDERSTANDING

An essential foundation for any MWSA is a commitment to developing students' deep mathematical understanding of both conceptual and procedural knowledge. Ensuring that students develop deep mathematical understanding requires a commitment to teaching in a way that builds procedural fluency from conceptual understanding (NCTM, 2014b). Students should be "doing mathematics" in ways that focus on (a) reasoning and sense-making, (b) the mathematical practices or processes adopted in your setting, and (c) grade-level college and career readiness standards. Students should be doing mathematics (as described in Smith & Stein, 1998) through the implementation of tasks that are cognitively rigorous and relevant, offer various solution approaches, and enhance students' sense-making of a variety of mathematical ideas. (For more information on developing students' deep mathematical understanding, we suggest reading Chapter 5 of *Catalyzing Change in Early Childhood and Elementary Mathematics: Initiating Critical Conversations* [NCTM, 2020].) Along the way in this book, you will likely find times when you and your team need to brush up on the content knowledge and pedagogical content knowledge (PCK) needed for teaching mathematics. We suggest exploring the grades PK–2 and 3–5 books from the two NCTM series *Developing Essential Understanding* (2010–2013; content focused) and *Putting Essential Understanding Into Practice* (2013–2019; PCK focused). An MWSA should be built around a schoolwide instructional plan that aligns with the professional commitment of all teachers of mathematics to developing students' deep mathematical understanding. Making this pledge means avoiding disjointed and surface-level changes (e.g., using consistent vocabulary but not engaging students in deep conceptual learning) that will ultimately not prepare children for their mathematical future.

CORE MWSA IDEA

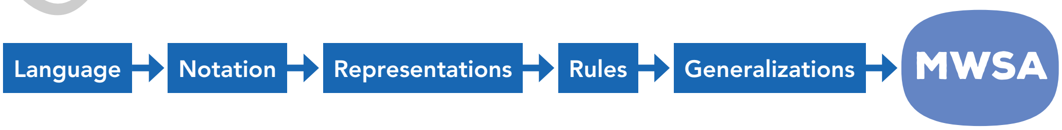
To change your practice, you have to practice change!

THE MWSA PROCESS

As we move to accept the thinking that change is not a passing fad that will simply disappear but, rather, something that benefits all players permanently, we will discuss two main components of the MWSA. First, we will detail the following central components of what all teachers and other stakeholders are agreeing to (see Figure 1.4):

- Correct and consistent language (Chapter 2)
- Precise notation (Chapter 3)
- Cohesive and consistent representations (Chapter 4)
- Evaluating rules that expire (RTEs; Chapter 5)
- Building generalizations and developing instructional strategies (Chapter 6)

FIGURE 1.4 • CENTRAL COMPONENTS OF AN MWSA JOURNEY



Note: MWSA = Mathematics Whole School Agreement.

Then, after you read Chapters 2–6, you'll be immersed in the second component of MWSA (Chapters 7–9), which is the last step in Figure 1.4 and an expansion of the agreement process discussed above, including everyone's commitment to it, their willingness to make change, effective instructional strategies, the structure of the lessons, and the eventual outreach to others. Not only does this process involve teamwork in structuring MWSA-aligned instruction, but you'll also explore next steps for expanding and refining this MWSA work and ensuring long-term sustainability.

In the following Reflection, predict what might be the easiest pieces for colleagues to agree to. How will exploring the next five chapters support your school as you consider developing an MWSA?

REFLECTION: MWSA–FORECAST

Think about the next five chapters, which will form the foundation of your MWSA. Here are some prompts to spark beginning discussions in your professional learning team or as coaches or mathematics leaders begin to think about implementing these ideas:

1. Who might you enlist as early adopters to help build your MWSA team?
2. What are some strategies you might use to gain buy-in from those who are initially resistant to the idea of an MWSA?
3. What do you think will be the easiest aspect of the MWSA for your school to agree on?
4. What are some potential challenges for both veteran teachers and novice teachers that you can predict?
5. How might the MWSA be integrated with your current curriculum materials in the school?
6. How might the MWSA lead to work that is more aligned with your content standards and mathematical practice or process standards?
7. What materials do you forecast you will need to implement the MWSA?

The following template will travel with you throughout the book. We show it here as a starting point to jot down notes as you move through the various chapters. What will you commit to in each component? Then you can partner with others and eventually discuss as a whole group what will go into your MWSA. Keep a copy of this form in your book, as it will serve as a reminder to answer the question "What will you commit to?" The more each person agrees to make changes, the stronger your agreement and your school, and your students' mathematical knowledge will be. Let's jump on board!

TRY IT OUT

Name: ______________________ Grade: __________

Language
Notation
Representations
Rules
Generalizations
Instructional strategies
Lesson structure

Source: Template inspired by Karp, K., Bush, S. B., & Dougherty, B. (2016).

online resources Available for download at **resources.corwin.com/mathpact-elementary**

PUTTING IT ALL TOGETHER!

In the book *The Multiplier Effect: Tapping the Genius Inside Our Schools* (Wiseman et al., 2013), the authors describe the characteristics of people who are either multipliers or diminishers. They suggest that when people take on the role of multipliers they can build the "collective, viral intelligence in organizations" (p. 19). Multipliers will try to implement the MWSA and gather together as a force all those who are engaged in teaching children mathematics, to build over time the strengths of each and every student and child. This approach of multiplying the talent of teachers "generates the collective will and stretch needed to undertake the most paramount of challenges" as they invest in a collectively agreed-on cause (Wiseman, 2017, p. 126). In this case the cause is developing mathematically literate members of a democratic society who are well positioned to make contributions to their communities and workplaces and who feel empowered to make the world a better place.

NEXT STEPS

Now that we've started on this journey, you are seeing the full landscape of the task ahead. What stands out to you about the MWSA? What surprises you? What makes sense to you and resonates with your teaching approach? What worries you? Who is the first person you will ask to join you on this quest? Continue this journey with us as we launch into establishing your MWSA with correct and consistent mathematical language in Chapter 2. We will investigate strategies for developing a common language and notation for the elementary grades. We will also consider how these beginning steps will shape the process you will use throughout the MWSA in getting your team talking about the mathematical ideas and solidifying the ways in which decisions will be made.