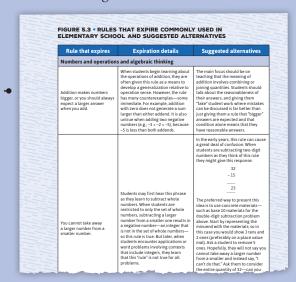
# The Math Pact The Book at a Glance

Consider this book your handbook and go-to guide for ensuring equitable, coherent instruction across grades, schools, and your district. You'll find a number of features throughout the book to aid you in your journey creating a Mathematics Whole School Agreement (MWSA).

Words that expire	Expiration details	MWSA-suggested alternatives
General		
"Show your steps"	"Show your steps" suggests that the student should be carrying out a procedure.	Instead, we recommend saying "Explain your thinking," as this phrase is inclusive of multiple options of the possible mathematical representations (e.g., concrete models, Illustrations, words, graphs, symbols) and multiple strategy options.
Numbers		
Using the words take away as the generic way to read a subtraction sign in an equation—such as 14 – 8, read as "14 take away 8"	Not all subtraction problems are take-away situations and thus should not always be read that way.	Instead, simply use minus when reading such an expression or equation. Other ways to describe it include "14 subtract 8," "8 less than 14," or "the difference between 14 and 8."
Calling zero a placeholder	A placeholder is something that stands for something else. Zero is not a placeholder for another number.	Zero is a number, and as such it is a value that ma in some cases represent no units or no tens, no tenths, no hundreds, no hundredths, and so on in the decimal representation of the number.
Reading a multidigit whole number such as 123 as either "one, two, three" or "one hundred and twenty-three"	Reading a number by its digits only does not promote understanding of the number's magnitude. When the word and is inserted, it implies that the number consists of a whole and a part, as in a decimal or fraction.	123 bould be read as time hundred sweetly here. The same is turn for other multidigit whole numbers—on and. Meaning must be developed from the start, and here is no place value meaning given by calling out digits. However, the word and can be stated when you are reading a number that has a decimal point in 1.45 being read as 'two and forty-free hundred this control of the start of the start scents) or a mise out multi-scent as 'gread as 'three and one half.' When people in the media read a multidigit whole number and say. The acample, for the year 2022, 'twenty, twenty-one' or example, for the year 2022, 'twenty, twenty-one' caused to the start of the start of the scent size of the start of the scent size of scent scent scent size scent sce

In-depth charts will help you find a consistent approach to preferred and precise mathematical language, notation, representations, rules, and generalizations that will help clarify students' mathematics understanding.



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Remember, as you work through this chapter, you're actively establishing the RTE component of your MWSA—you're making great progress!

## WHAT ARE RTES?

RTEs are a deeply rooted tradition in mathematics education, a means to teach a procedure or a strategy in a way that the teacher believes makes the learning easy and fast or helps students remember. Sometimes RTEs are used with the best of intentions as an attempt to make learning "fun." However, let's be clear: RTEs are harmful in the long term and should not be used. We authors learned this the hard way by teaching these rules in our classrooms only to regret it later when we taught other grades or learned more mathematics content. RTEs might temporarily seem to help in the short run, but in the long run they support the myth that mathematics is a set of disconnected tricks and shortcuts, is

magical, or at worst is incomprehensible. The basic premise of RTEs is to teach for convenience or speed, and the subsequent initial appearance of student success fuels the continuance of teaching these rules. In

other words, being able to apply RTEs by rote may get students through the next problem, quiz, test, or highstakes assessment, making it seem as though there is deep conceptual understanding (or a strong reason to teach this way) when often there is not. Then, when that appearance of success leads us to believe that students understand more than they do, we use the RTEs again. In essence, the use of the "trick" or the "shortcut" becomes a self-fulfilling prophecy. Instead, we should teach for the future mathematics we know is coming and emphasize enduring understanding and

rules that are used in mathematics or later fall apart or do not promote mathematical understanding.

Tricks, shortcuts, or

# CORE MWSA IDEA

Even actions we take as teachers that seem well-meaning can be harmful in the long run!

Throughout the book, find definitions of key terms and notes on core MWSA ideas.

CORE MWSA IDEA

Reflection tasks help you consider how key ideas relate to your own instruction



### **CONSTRUCTION ZONE-WHAT** REPRESENTATIONS ARE MOST BENEFICIAL AND SPAN THE GRADES?

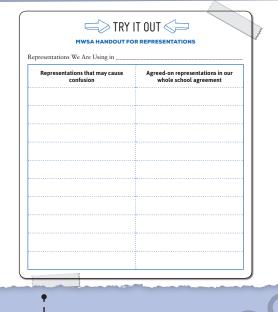
As you think about the representations you will use as part of your MWSA, consider these questions

- · Which representations can you agree on that will span multiple grades?
- Which representations have you used that are not productive in terms of helping students learn or for which you may not know all the options for using them?
- Which representations might cause confusion or create or perpetuate misconceptions?

Using the following space, record representations that are being used that need to be rethought, those that might need further explanation, and others that can and should be used across the grades. Then, as you continue reading this chapter, other suggestions may help you spark new ideas or prompt you to reconsider what can be used as appropriate alternatives.



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Try It Out and Things to Do sections provide concrete opportunities to directly engage with your team in creating a Mathematics Whole School Agreement.



# Send the Letter

Hello

We have already written to you about the Mathematics Whole School Agreement (MWSA) that we are developing across the entire school this year. As you know, we are all working hard to align our instruction in mathematics across the grades. As you may remember, earlier this year you received a letter where we talked about the mathematical language and notation we use during instruction. We are now looking at the representations we use in mathematics. As a mathematics team, we have agreed on the physical materials we may use to model the mathematics and the ways in which we explain the mathematics by means of pictures or diagrams and mathematical symbols. Everyone in the school involved in the teaching and learning of mathematics is using these and is focused on teaching for students' depth of understanding and connection to mathematical ideas within and across grades. The way we model in mathematics has an effect on the way students understand mathematical ideas. We want your student to become an adult who knows mathematics and will succeed in whatever they choose to do in life. We thank you for joining us in making this shift to be consistent in how we support your student as we prepare them for their personal and professional future.

Thank you for your help,

Your student's teachers and principal and members of the school community

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