Publisher's Response to EdReports Review of *HMH Math Expressions* ©2018 (Grades K–2)

Houghton Mifflin Harcourt

Introduction

Math Expressions ©2018 is based on extensive research funded by the National Science Foundation. It is a proven curriculum designed to improve student learning and engagement and we believe the final published report of "Meets Expectations" for Grades K–2 provides a resounding endorsement of *Math Expressions.*

Dr. Karen Fuson and the entire team at Houghton Mifflin Harcourt are grateful for the in-depth review performed by the EdReports committee and we appreciate the opportunity to highlight instances where we believe the program did in fact meet the stated criteria of the Scoring Guide.

Indicator 1c

Grade 1
EdReports: The instructional materials … partially meet expectations that supporting work enhances focus and coherence simultaneously by engaging students in the major work of the grade.

The *Math Expressions* review states that supporting content is connected to the major work of the grade but subtracts 1 of 2 points for supporting work in Units 6 and 7. The Ed Reports Evidence Guide does not say where supporting work should occur.

Indicator 1e

Kindergarten
EdReports: The instructional materials … partially meet expectations for the materials being consistent with the progressions in the Standards.

One example was given of a standard (K.CC.2) where evidence for this standard in lessons noted was not found.

Math Expressions includes multiple resources that explicitly address standard K.CC.A.2. The correlation will be corrected in future printings.

- Student Activity Book:
  Lessons 2.9, 2.14, 2.18, 3.11, 3.13, 5.10
- Teacher Edition:
  Lessons 2.10, 2.12 (Teacher Note), 2.15, 3.2 (English Learners), 3.5, 3.11 (English Learners), 4.5, 4.15, 5.5

In Kindergarten, the following instances were erroneously identified by EdReports as addressing above grade-level content.

1. *Lessons 2.7 and 3.14 introduce the ≠ sign.* The EdReports review states that this sign is taught in standard 1.OA.7. In Grade 1, students identify equations as True or False, a different concept. The ≠ sign is not used in any standard so we do not feel it is above grade-level content.
2. *In Lesson 4.1, students solve comparison problems which are not labeled above grade-level content.* Kindergarten comparisons ask, "Which is more? Less?" whereas Grade 1 comparisons ask for the actual difference.
3. *In the Daily Routine 'Use the Counting Tens and Ones Flipchart'* In Kindergarten, the number 66 is taught as six groups of ten ones, written as 10 + 10 + 10 + 10 + 10 + 10 + 6 to record six groups of 10 blue circles and 6 more circles. The tens in 66 are represented on the flipchart as groups of ten single units and so are not addressing above grade-level content. In Grade 1, tens in 1.NBT.2 are represented as a new, higher-order unit—"a ten"—that is a bundle of ten ones. Therefore, 66 in Kindergarten is not 6 units of ten and 6 ones, as it is in Grade 1.

Grade 1

EdReports: The instructional materials … follow the progressions of the standards, and identify prior knowledge, however, there are grade-level standards that are not fully met.

The report erroneously cites instances where the full intent of the standards are not met.

1. **Unit 7:** The review says that standard 1.MD.1 is not met. However, the description indicates the reviewer must have meant 1.MD.2, which concerns iterating length units to measure. The EdReports review states that students "are not given the opportunity to measure with different objects or to compare how the measurements are different if different measuring tools . . . are used"—but comparing how measurements vary with different measuring tools is a Grade 2 standard. Students are only learning to measure iteratively in Grade 1, and they use different tools as they learn to measure iteratively:
   - In the Teacher Edition page 672, students discuss how measuring with hands might be problematic, thus developing an understanding of the need for standard units of measurement. **Learning Community** discusses the importance of same-sized objects. The corresponding activity has students use paper strips of equal length.
   - On Student Activity Book pages 321 and 322, students measure with paper clips.
   - On **Home and Remembering** page 177, students measure with paper strips.
   - On Teacher Edition page 676, **Home or School Activity** suggests using postage stamps to measure iteratively. Students make a list of objects that can be used, choose an object from their list, and measure with that object.

2. **Unit 4:** The review states there are four lessons that address standard 1.NBT.3, comparing two-digit numbers using symbols, but in Unit 8, Lesson 6, ". . . no symbols are used for the comparisons." However, in that lesson, on Student Activity Book page 731, students write symbols to compare numbers two different ways. The instruction recommends a prior discussion asking students "what they remember about comparing

2-digit numbers using >, <, and =." In Activity 2 on page 732, the suggested student answer shows the results of the comparisons using the symbols.

3. **Unit 8:** One lesson is cited as above grade level. The CCSSM Grade 1 critical area states the following: "Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 . . ." The review states that because students are using the "New Group Above" method of addition (which is the standard algorithm) to add two-digit numbers, they are working on standard 4.NBT.4. However, both of the methods discussed in Unit 8, Lessons 1–2 fit the Grade 1 description of this critical area.[1]

Indicator 2f

EdReports: The instructional materials attend to all eight Mathematical Practices. However, the instructional materials do not address the full meaning of Standard MP5 as tools are chosen for students, and there are few opportunities for students to choose tools strategically.

The EdReports Evidence Guides state that "Lessons specifically addressing learning to use certain tools are appropriate, especially at the younger grades," and "Every instance of a Mathematical Practice being marked does not necessarily have to encompass the full meaning . . . but taken together there should be evidence that the materials carefully attend to the full meaning of each practice."

For Mathematical Practice 5, *Math Expressions* gives students repeated experiences as each tool is introduced, building a foundation for choosing tools strategically later. Then students are encouraged to choose drawings or concrete manipulatives that make the most sense to them and to explain the reasoning behind their choices. These are tools as described in Mathematical Practice 5, and they are used frequently throughout the program and chosen by students.

Here are some examples of instructional features that support student choice of tools:

Math Talk in Action models for teachers how to encourage students to reason about different tools. **Math Talk** features and **Teacher Notes** encourage teachers to remind students they can choose the tool to use.

Teacher Edition pages

- **Kindergarten**
  226, 260, 273, 380, 450
- **Grade 1**
  5, 573
- **Grade 2**
  84, 144, 196, 710, 754

[1] For more about "the standard algorithm" and the CCSSM, see the NBT progression and Fuson, K. C. & Beckmann, S. (Fall/Winter, 2012-2013). Standard Algorithms in the Common Core State Standards. *National Council of Supervisors of Mathematics Journal of Mathematics Education Leadership, 14 (2)*, 14-30.

Student Activity Book pages

- **Kindergarten**
  page 132
- **Grade 2**
  69, 363, 387

Remembering page:

- Grade 1
  114

In-Depth Inquiry-Based Task Cards:

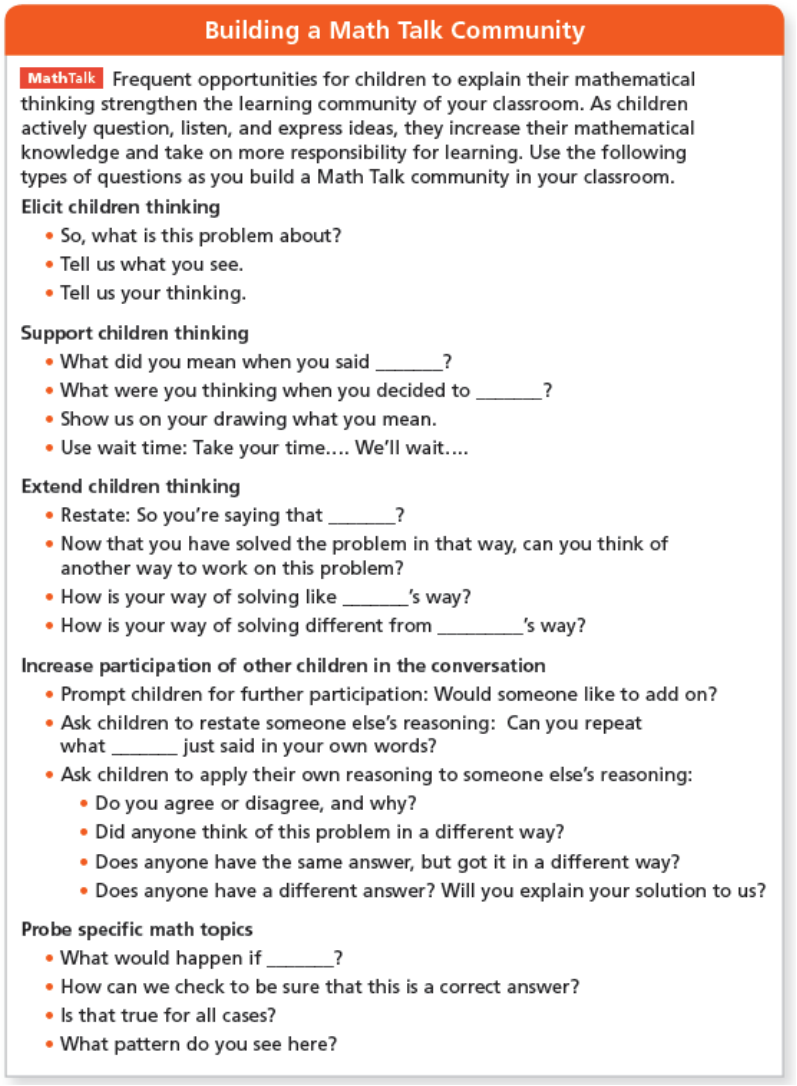
- Grade 2
  Unit 3; Remembering pages: Lesson 1.5

Indicator 2g.ii

EdReports: The instructional materials …partially meet expectations that the instructional materials assist teachers in engaging students to construct viable arguments and analyze the arguments of others concerning key grade-level mathematics.

The Evidence Guide requires teacher prompts and suggested questions, stating as follows: "The materials might guide teachers to ask students to explain their thinking or justify their solutions . . . to have students look at a solution and decide if it is correct or incorrect and explain why." As EdReports states, in *Math Expressions,* "Math Talk is a critical component of the instructional materials and presents opportunities for students to use a consistent structure: Solve, Explain, Question, and Justify."

The perfect scores attained for Gateway 3 indicate that *Math Expressions* enhances a teacher's ability to promote student learning. Student explanations are followed by questions from peers and further justification. Instructions for setting up a **Math Talk Community** are shown below. Teachers use these questions all year although assistance is given frequently provided at other points.



Building a Math Talk Community

MathTalk Frequent opportunities for children to explain their mathematical thinking strengthen the learning community of your classroom. As children actively question, listen, and express ideas, they increase their mathematical knowledge and take on more responsibility for learning. Use the following types of questions as you build a Math Talk community in your classroom.

Elicit children thinking

- So, what is this problem about?
- Tell us what you see.
- Tell us your thinking.

Support children thinking

- What did you mean when you said _____?
- What were you thinking when you decided to _____?
- Show us on your drawing what you mean.
- Use wait time: Take your time.... We'll wait....

Extend children thinking

- Restate: So you're saying that _____?
- Now that you have solved the problem in that way, can you think of another way to work on this problem?
- How is your way of solving like _____'s way?
- How is your way of solving different from _____'s way?

Increase participation of other children in the conversation

- Prompt children for further participation: Would someone like to add on?
- Ask children to restate someone else's reasoning: Can you repeat what _____ just said in your own words?
- Ask children to apply their own reasoning to someone else's reasoning:
  - Do you agree or disagree, and why?
  - Did anyone think of this problem in a different way?
  - Does anyone have the same answer, but got it in a different way?
  - Does anyone have a different answer? Will you explain your solution to us?

Probe specific math topics

- What would happen if _____?
- How can we check to be sure that this is a correct answer?
- Is that true for all cases?
- What pattern do you see here?

The extensive **Unit Overviews** describe visual and conceptual support to assist teachers in supporting students in explaining/justifying and questioning/critiquing. **Math Talk in Action** models student discussion to support developing students' ability to construct arguments and analyze responses. There is frequent support for teachers in this feature, and each Big Idea section of a unit includes an example. **Teacher Notes** provide support for discussions about student thinking or leading **Math Talk**. Some examples are listed below:

Teacher Edition pages

- **Kindergarten**
  30, 32, 103, 199, 262, 459, 524
- **Grade 1**
  67, 456, 536, 595, 740, 753
- **Grade 2**
  7, 84, 228, 500