

## ***Math in Focus®: Singapore Math®* by Marshall Cavendish Publisher’s Response: Grades K–8**

October 2021

Marshall Cavendish Education and HMH fully support the EdReports vision—to ensure that “all students and teachers will have access to the highest quality instructional materials that will help improve student learning outcomes”—and appreciate the time and work of the EdReports panel in reviewing ***Math in Focus®: Singapore Math®*** by Marshall Cavendish.

***Math in Focus®*** is the U.S. version of the successful Singapore curriculum developed by Marshall Cavendish and used in the highest achieving math classes in the world.

The series interweaves the robust fundamentals of ***Singapore Math®*** with the Common Core State Standards for Mathematics (CCSSM) to provide mastery of every grade level’s work. The tightly woven scope and sequence of ***Math in Focus®*** ensures that students build on what they have learned and deepen their knowledge with each successive encounter. While ***Math in Focus®*** foregrounds the CCSSM in each grade to thoroughly cover the required work, it also thoughtfully and intentionally includes foundational work for the next grade. Students are therefore able to successfully achieve fluency and mastery at every grade level.

Since its beginning in 2009, ***Math in Focus®*** has contributed to the success of some of the highest performing districts in the country. In addition, ***Math in Focus®*** Grades K-5 was rated as “Strong” to meet the Every Student Succeeds Act (ESSA) from the Center for Research and Reform in Education at Johns Hopkins University.

This edition retains the fundamentals and pedagogy of the earlier editions while incorporating the latest emphasis of the Singapore’s Mathematics Syllabus. The Teacher Edition, through a partnership between Singaporean educators and U.S. experts in ***Singapore Math®***, brings together the best practices of ***Singapore Math®*** with the experience of seasoned U.S. teachers.

### ***Singapore Math®*, Effective Pedagogy, and CCSSM**

The education reform organization Achieve states that Singapore’s Mathematics Syllabus aligns well with the CCSSM in terms of rigor, coherence, and focus. In fact, Achieve the Core recommended that Singapore’s Mathematics Syllabus should be a model for the development of U.S. standards.

“Overall, the CCSS are well aligned to Singapore’s Mathematics Syllabus. Policymakers can be assured that in adopting the CCSS, they will be setting learning expectations for students that are similar to those set in Singapore in terms of rigor, coherence, and focus.” (2010; [achieve.org/ccssandsingapore](http://achieve.org/ccssandsingapore))

## A Model for the Common Core

The National Math Panel, the National Governors Association, The Council of Chief State School Officers, and Achieve the Core have highlighted the desirability of emphasizing fewer topics per grade but in greater depth. This is synonymous with the Singapore’s Mathematics Syllabus, on which **Math in Focus**® is based.

“The Singapore standards provide an established example of curriculum standards designed to develop proficiency in a relatively small number of important mathematics topics”

(National Math Advisory Panel, 2008)

“World-class content standards cover a smaller number of topics in greater depth at every grade level”

(National Governors Association, the Council of Chief State School Officers, and Achieve, 2008)

## Focus, Coherence, and Rigor

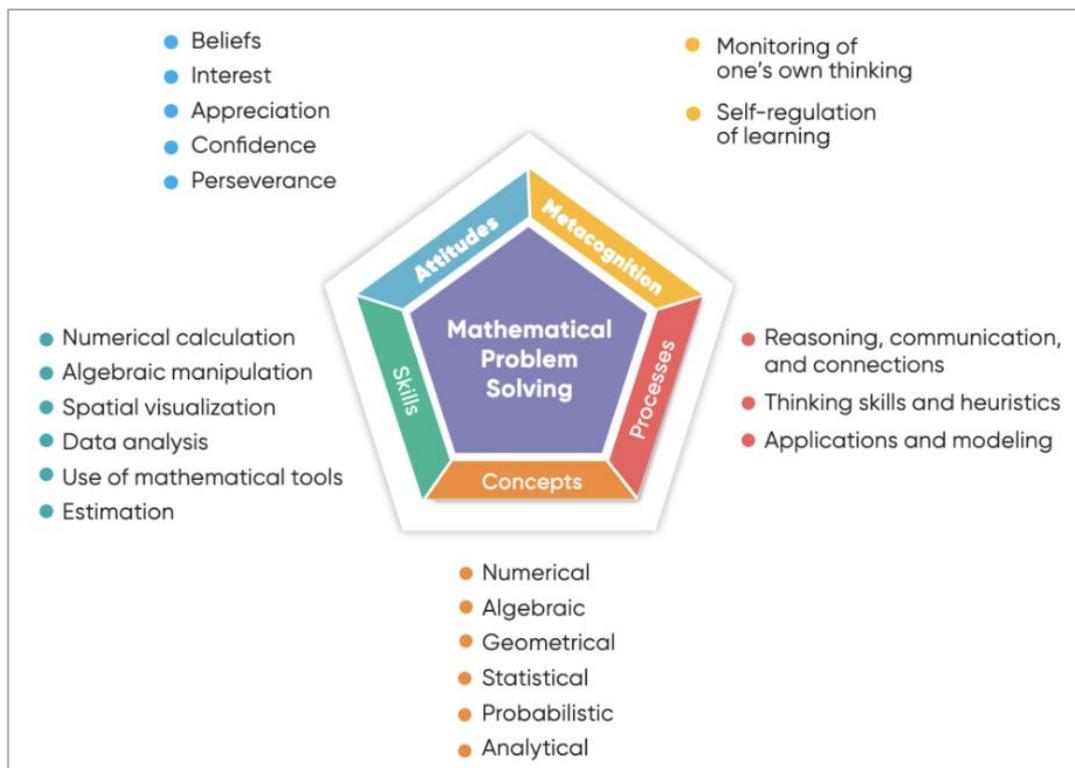
**On Focus:** **Math in Focus**® provides focus and depth on each grade level’s topics. The Engage-Learn-Try focus cycles reinforce that depth. Variation of both perceptual and numerical aspects of exercises help students see problems in multiple ways, leading to greater mastery. Additionally, exposure to foundational work helps prepare students for mastery in later grades.

**On Coherence:** To learn most successfully, students must first be ready. Every chapter in **Math in Focus**® begins by preparing students for the topic. Addressing the gaps in prior learning is key in this preparation. The **Math in Focus**® Student Edition, Teacher Edition, and Transition Guide allow teachers and students to understand the coherence of the scope and sequence by linking the current work to earlier and future work. The tightly woven scope and sequence of **Math in Focus**® ensures that students deepen their knowledge of a topic with each encounter.

**On Rigor:** **Math in Focus**® provides a rich variety of tasks and questions throughout every chapter for students to build conceptual understanding and problem-solving skills. A series of heuristics (strategies) helps build students’ capacity to explore novel problems.

## Alignment in terms of Rigor and Mathematical Practices

Problem solving is the central focus of the Singapore Mathematics Curriculum Framework. The Singapore Mathematics Curriculum Framework's five interrelated components align well with the Mathematical Practices (MP) in the CCSSM. *Math in Focus*<sup>®</sup> embeds the mathematical practices in the CCSSM into every aspect of students' experiences.



### Mathematical Problem Solving and Student Attitudes (MP1)

*Math in Focus*<sup>®</sup> focuses on problem solving by providing students with a rich variety of tasks so that students learn **for, about, and through** problem solving to master concepts and apply them to nonroutine, open-ended, and real-world problems.

Students are equipped with a four-step model, based on George Pólya's seminal work (1957), to approach problem solving in a systematic way. They find an entry point, plan a strategy, and evaluate the reasonableness of their results. Additionally, *Math in Focus*<sup>®</sup> problem-solving heuristics to equip students with different possibilities for approaching or solving nonroutine problems. Students' positive attitude, perseverance, and confidence towards problem solving are nurtured consistently throughout the series.

### **Using Tools Strategically (MP5)**

*Math in Focus*® encompasses the strategic use of mathematical tools to learn and apply mathematics in a variety of situations. Students use concrete models for exploration of complex topics. They can choose among these models and among visual representations as they solve problems and concretize abstract mathematical situations. Additionally, students use technology to model mathematical situations in a variety of ways.

### **Using Mathematical Models and Reasoning (MP4 and MP2)**

Students with a deep understanding of mathematical concepts can apply them to a variety of real-life problems. Following Richard Skemp’s work (1976), *Math in Focus*® helps students build both instrumental and relational understanding, *while* connecting across topics.

*Math in Focus*® uses the Concrete-Pictorial-Abstract (CPA) approach, based on Bruner’s three modes of representation: enactive-iconic-symbolic, to systematically and consistently help students achieve deep conceptual understanding of mathematical concepts. The CPA approach nurtures competent problem solvers to understand and articulate the not only the “*how*,” but also the “*why*.”

The careful use of variation in *Math in Focus*® to sequence learning tasks and questions is key in helping students to fully grasp the concepts by building upon as well as deepening what they currently know. Once students have a good grasp of the concepts through understanding the “*how and why*,” they will be well equipped to model with mathematics to solve problems in real-life situations.

### **Making Use of Structure and Looking for Patterns (MP7 and MP8)**

*Math in Focus*® leverages mathematical language and a focus on reasoning to help students look for patterns and make use of structures to discover mathematical results on their own.

### **Metacognition and Constructing Viable Arguments (MP 3)**

Metacognition is foundational to *Math in Focus*®. The learning experiences and higher-order thinking problems provide multiple opportunities for students to engage in productive struggle through constructing viable arguments. In addition, *Math in Focus*® provides opportunities throughout for students to analyze and assess others’ arguments.

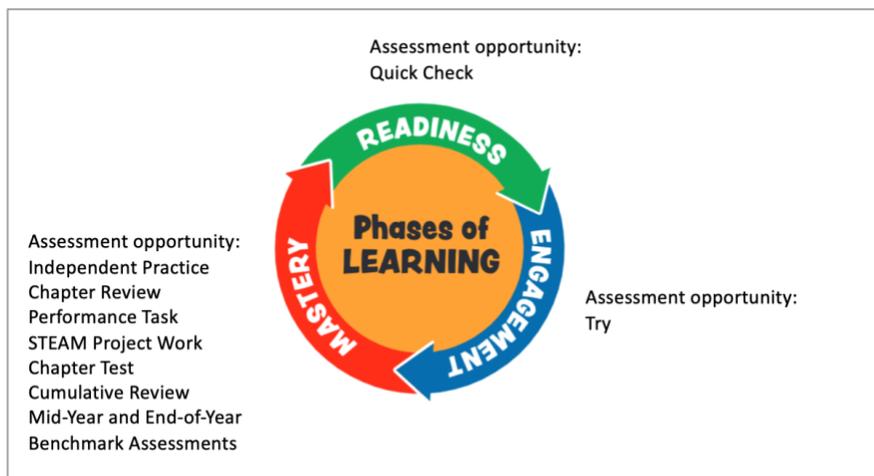
### **Usability**

*Math in Focus* was not evaluated for usability criteria. *Math in Focus*® provides strong support for planning, differentiation across a variety of student needs, and assessment, both in its print materials and online on the HMH Ed platform. Teachers can customize lesson plans and assign differentiated practice materials. Digital versions of assessments further support differentiation, with built-in grouping features and standards-based resource lists. Additional digital content, such as videos, virtual manipulatives, and games, provide options for engagement, exploration, practice, and mastery. Teacher’s Corner provides educators with a wide range of opportunities to learn and grow.

## Flexible and Ongoing Assessments for Progress Monitoring

**Math in Focus**<sup>®</sup> not only provides teachers with a solid teaching and learning experience that is research-based and backed by data, it also integrates different forms of assessments as part of the interactive process of teaching and learning to monitor students' progress before, during, and after each chapter.

**Math in Focus**<sup>®</sup> assessments—diagnostic, formative, and summative—are flexible and embedded within the Readiness-Engagement-Mastery phases of learning to check students' progress and level of mastery.



Assessments in **Math in Focus**<sup>®</sup> measure three levels of knowledge:

- Type I items assess students' grasp of concepts, skills, and procedures.
- Type II items assess students' ability to demonstrate mathematical reasoning through statements, arguments, or justifications.
- Type III items assess students' ability to demonstrate their understanding of problems with real-world contexts.

**Math in Focus**<sup>®</sup> meets and exceeds the requirements for focus, coherence and rigor through a tightly-woven, articulated and challenging curriculum designed to help students master the math and experience success in CCSSM and beyond at every grade level. The program, which is based on the U.S. version of the authentic and successful Singapore curriculum developed by Marshall Cavendish, has proven to be effective for students in the U.S. in a variety of settings as measured by independent research studies.