

## Frequently Asked Questions by Parents about *Math Expressions*

### 1. What are the strengths of your program?

*Math Expressions* is a comprehensive mathematics program that:

- develops mathematical concepts deeply and also develops skills through the use of research-based instructional strategies and learning paths, with daily investigative activities using objects, drawings and real-world situations to help students make sense of the math and practice activities including facts fluency plans at grades 3–5
- provides rich resources in the Teacher Edition for hands-on activities with manipulatives and conceptual supports such as secret code cards, visual activities with MathBoards and “proof pictures”, learning center activities, and Math Talk experiences, helping students explain and justify their thinking and develop their reasoning
- includes rich problem-solving and reasoning opportunities that focus on word problem types and structures, similar to the approaches in cognitively guided instruction (CGI)
- relates research-based accessible algorithms to common algorithms, providing bridges from concrete, to pictorial, to abstract fluency, and
- focuses on inquiry and fluency (the hallmark of *Math Expressions*) that ensures student achievement of the Washington K – 12 Mathematics Standards.

*Math Expressions* is a balanced program, focusing on conceptual understanding, procedural fluency, and problem solving and mathematical processes as called for in the revised Washington K–12 Mathematics Standards. *Math Expressions* supports in-depth core content in all five content strands. At grades K–1, Geometry and Measurement are integrated into all units as would be developmentally appropriate at those grades. In Grades 2–5, these topics appear in units strategically placed between units, which integrate Number, Algebra and Data. This organizational approach allows teachers to teach geometry and measurement earlier and throughout the year, making application more meaningful and ensuring deep, rich understanding. More importantly, it allows for emphasis on the core content at each grade level. Each lesson in *Math Expressions* is correlated to the Washington K– 12 Mathematics Standards.

*Math Expressions* provides teachers with materials that are easy to use and manage so they can focus on the teaching plan for their students, not gathering materials and preparing themselves to teach. The Teachers Editions complete with eTeachers Edition hot-links to quick on-demand professional development, lay out each lesson with a complete description of the activity and what to expect from the children as well as prompts for Math Talk. The core classroom structures of Quick Practice, Student Leaders, Building Concepts, Math Talk and Helping Community are a part of every lesson from Kindergarten to Grade 5. This structure creates a classroom environment that fosters problem-based learning experiences and the development of deep understanding through the use of research-based instructional strategies and learning paths. Communication and reasoning become everyday events using these core structures. The learning paths build on mastery at each level. For instance, students move from concrete to pictorial to abstract in learning accessible algorithms aided by their strong conceptual understanding of place value in the base ten system and composition/decomposition of numbers. *Math Expressions* is elegant in the strength and simplicity of putting research about how children best learn math into practice. Daily concept development activities using objects, drawings and these real-world problem situations help students make sense of the math. Daily Math Talk opportunities raise the level of communication, thinking and reasoning to that required in the revised Washington K– 12 Mathematics Standards.



# Math Expressions

### 3. How can I support my child at home in math? Is there a parent/home connection?

A major goal in developing the components of *Math Expressions* was to build a strong partnership between home and school by helping parents understand both the mathematics their child is learning and how it is being presented in the classroom.

In *Math Expressions*, a Home and School Connection is included in each lesson at every grade level (K–5). The opening lesson of each unit provides a Family Letter (in English and in Spanish) that explains the conceptual ideas of the unit. The letter also provides examples of accessible algorithms that the students will be learning in school and need to apply to their homework. These explanations and examples give parents a concrete strategy to use with their child to review and reinforce the concept and/or skill taught in the lesson. For other lessons, when a Family Letter is not provided, a cross-curricular activity is recommended that relates the math content to other areas of the students' lives.

In the Student Activity Book and the Homework and Remembering Book, take-home games, manipulatives, and fluency routines are provided for students. This encourages at-home practice to continue when students leave school.

Also in the Student Activity Book and the Homework and Remembering Book, models, explanations, questions, and examples on the lesson and homework pages are valuable tools for parents to understand, and then reinforce, what their child is learning and how they are learning it.

*Math Expressions* can also be found as part of our Digital Classroom that provides online resources for students and families. Student workbook pages, Soar to Success Math, Homework and Remembering pages, and the family letter are all available to parents, grandparents, daycare providers, and students.

- Education Place © ([www.eduplace.com](http://www.eduplace.com)) provides free, online support for students and parents.
- The eMathBook ([www.thinkcentral.com](http://www.thinkcentral.com)) also provides an online version of Student Activity Book and Homework and Remembering for parents and students to access and use a reference guide.

### 4. My child struggles in math. What does *Math Expressions* do to support, and help gain math confidence, and growth for my child?

*Math Expressions* accommodates students needing extra support for remedial intervention to meet expectations. For those students who need more support with a specific content area or skill, teachers can use the Extra Practice or Targeted Practice activity pages. The built-in, daily Quick Practice routines not only promote a learning community, competence, and computational fluency, but allow teachers to work with small groups or individuals who need extra help on targeted skills. Each lesson also has a Homework and Remembering page that includes a spiral review portion which helps students maintain previously covered math standards.

Additionally, *Math Expressions* lessons include intervention, on-level, and challenge differentiation to support all classroom needs. The intervention cards are designed for students struggling with grade level content and can be used as centers, small group, or individual use. Each card includes a writing prompt, teacher notes in the Teachers Edition and software support with Soar to Success Math—our technology intervention component. With Soar to Success Math, students are given a quick assessment that both identify the strands in which a student is struggling as well as the highest level skill within a strand that a student experiences success. Then building from that success, and using interactive and voiced instruction, student's move upwards towards grade level achievement. The meticulous identification of skills knowledge, combined with focused, fun, instruction, builds understanding and confidence.





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*Math Expressions* accommodates for special-needs students in an array of activities. There are opportunities for students to draw and view representations (kinesthetic and visual), listen to classmates discuss solution strategies and solutions (auditory) and explain and discuss their own strategies and solutions. This systematic multi-sensory approach is very effective with special education students (oral and auditory). The clean, well-organized nature of the MathBoards, and the Student Activity Book and the simple, unambiguous activity directions also support the needs of special education students.

## 5. What enrichment features are offered in *Math Expressions* for my math savvy child?

*Math Expressions* also provides challenge activities for high-ability students. Going Further activities, leveled writing prompts, Challenge activities, and the special Math Center Challenge Easel include activities for the highest performing math students.

## 6. Describe the role of problem solving in your program?

The Childrens Math Worlds Research Project, on which *Math Expressions* is based, indicated that children worldwide intuitively solve problems by modeling the actions and relationships in the problems. With *Math Expressions* © 2009, children first learn to look for scenes of numbers in their real world. They then are encouraged to model the action or relationship in the problem with manipulatives and later with math drawings. When they begin to learn to add and subtract and later multiply and divide children are shown various CGI-like problem types and structures such as change-plus, change-minus, collection and comparison models. These structures, along with graphic organizers of situation/solution equations and comparison bars, allow students to see that the unknown varies in its location in the equation depending on the situation. They see this varying of the unknown again when they take their WASL and other tests. The *Math Expressions* approach gives students a powerful strategy of modeling the situation then writing one of the situation-solution equations for addition/subtraction or one of the situation/solution equations for multiplication/division to solve the problem. Mathematical Processes lessons close out each unit to help students apply their problem-solving skills while making connections within the mathematics and across the curriculum.

## 7. Are traditional algorithms and alternative methods presented together throughout the book? In general how many alternative methods are introduced?

Yes. Dr. Karen Fuson, author of *Math Expressions*, calls the research-based algorithms in the program, accessible and mathematically desirable. The algorithms grow up out of students' understanding of the base-ten number system. Moving from manipulatives to math drawings to the abstract algorithm students develop deep understanding. For example, with multi-digit addition students can model with manipulatives, secret code cards, and math drawings the Show All Totals Methods. Using these same representations, students can move a step closer to the abstract algorithm by using New Groups Below. Ultimately, they can add using New Groups Above (the traditional U.S. algorithm).

In general there are three accessible algorithms for each operation plus an approach to operations on fractions that is based on unit fractions.



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## 8. We have some EL Learners (English Language) in our district, what supports are built into your program to address the needs of that group of students?

*Math Expressions* supports English-language learners. Math Talk, especially, has played a particularly crucial role for these students. In the Math Talk Learning Community several students solve their problem using a math drawing and formal math notation and then some students explain their work. The teacher and other students help as needed and ask questions to help the explainer describe more fully or extend their thinking. Initially, an English Learner may listen as questions are asked. However, the strong visual/verbal connection provided through the math drawings help English Learners to very quickly develop some of the vocabulary and language skills to be an explainer. In *Math Expressions* ©2009, an English-Language Learners Activity is included for each lesson including a common problem with scaffolding for three levels of language proficiency.

In *Math Expressions* ©2009, teachers approach math from the students' point of view and elicit their thinking and rich language use. Using both informal and formal mathematical language helps students develop the vocabulary needed to express their understanding. In this program, teachers are provided with support and materials that offer ongoing practice and application of lesson vocabulary.

- Language and Vocabulary Notes provide teachers with point-of-use support in the Teacher Edition. These classroom tips provide teachers with ideas and/or explanations of the math vocabulary.
- Through many years of research, Vocabulary Terms were gathered and woven into the learning materials. All of these terms capitalized on using effective language and solution methods that students could relate to and use in the classroom.
- Using Math Talk in the classroom allows students an opportunity to share their problem-solving strategies and solutions as well as apply math vocabulary in context. Specific classroom organizational structures and activities help students develop the skills and confidence necessary to explain and justify their solutions. Support in the *Math Expressions* Teacher Edition offers a wealth of learning activities that directly support language development, questioning procedures, and student-to-student talk.
- Visual Representations of vocabulary words in the Student Activity Book glossary make vocabulary words come alive. Also, in the primary grades, the pictures and illustrations in the Student Activity Book help cue young learners with solving word problems.

