



Scholastic *FASTT Math*

FASTT Math uses research-validated methods to provide systematic instruction and continuous practice to help students automatically recall and understand math facts in addition, subtraction, multiplication, and division. The program uses adaptive technology to offer each student a differentiated learning experience based on his or her individual strengths and weaknesses. Developing fluent recall of the basic math facts allows teachers and students to focus on more complex computations, problem-solving and higher-order math concepts in the math curriculum.

FASTT Math is an intervention program, in English and Spanish, designed to support students in second grade and up in establishing fluency with basic math facts from numbers 0-9 or 0-12. With interactive software, comprehensive teacher resources, and individualized practice sheets, students gain automatic recall of basic addition, subtraction, multiplication, and division facts, allowing them to free up critical mental resources so that they can focus on higher-order math. With the research-validated *FASTT* system—Fluency and Automaticity through Systematic Teaching with Technology—computer-based instruction is automatically differentiated in customized daily sessions based on continuous assessments of students' fluency.

Instructional Content

FASTT Math is designed to help a student develop fluency with basic math facts in addition, subtraction, multiplication, and division, in numbers ranges 0-9 or 0-12. The program begins by assessing the student's current fluency of facts (correct and fast answers). It then provides adaptive instruction in English and Spanish to help students build a memory relationship between a problem and its answer and increase the speed at which the student responds to problems.

Students must have the appropriate conceptual foundation to use the *FASTT Math* software. The *Fact Fluency Foundation Guide* provides instruction in number sense and operations for those students who lack a foundation in basic math concepts. The goal of the *FASTT Math* software is for students to be able to recall new math facts fluently from memory on a consistent basis in less than 1.125 seconds. The program uses a four-step process to help students create a memory association for a fact.

- a. **Step One: Fact Selection and Presentation**—The program selects a fact pair in the Fact Grid and presents each fact to the student. During fact presentation, the student sees and hears the facts, and is asked to say them aloud.
- b. **Step Two: Fact Model Screen**—The student has the option to see and hear an animated visual model that represents the fact.
- c. **Step Three: Fact Typing Screen**—The program asks the student to type each presented fact and provide the answer from memory.
- d. **Step Four: Fact Input Screen**—The pair of facts is presented in the expanding recall model to solidify the memory relationship and help students develop quick recall of the facts.

Instructional Design

FASTT Math employs a proven approach called “expanding recall” to help students move newly acquired math facts from short-term working to long-term memory. No more than three new facts are introduced during any given 10-minute session. Students practice holding new facts longer and longer in working memory until they make the leap to automatic retrieval. Developing automatic recall of basic facts provides the foundation needed for later development of higher-order math skills.

FASTT Math uses this effective procedure:

- a. The student is introduced to two or three non-fluent facts to study. Typically, but only when possible, the session's "Study Facts" appear as a commutative pair. The student is encouraged to read the facts aloud. The student can also watch an animated representation of each fact to help remind him/her in a more concrete way of what the fact represents.
- b. After seeing and speaking the new "Study Facts," the student is asked to type each number sentence into the computer. If he/she types the facts incorrectly, the facts are redisplayed, and the process is repeated. This helps establish a memory relationship with the fact in the student's mind.
- c. Once the student can correctly type the number sentences of the new "Study Facts," the program then presents a practice session with these facts. The program mixes presentations of the two "Study Facts" with a gradually increasing number of fluent facts. The student builds the capacity to hold the fact in memory for a longer and longer period of time. *FASTT Math* limits the allowed response time to prevent the student from employing non-automated strategies.
- d. When the student is able to recall the current "Study Facts" consistently, the facts are added as "Focus Facts" to the student's Fact Grid. The software provides extra practice to help the students solidify them in memory and increases recall speed.
- e. Once a student is able to recall his or her "Focus Facts" in less than .8 of a second, those "Focus Facts" are changed to "Fast Facts" on the student's Fact Grid.

FASTT Math also provides students with customized worksheets to practice their math facts in a paper-and-pencil format. Teachers can print problems in a vertical or horizontal format and in single- and multi-digit operations. These worksheets only include the math facts with which a student is fluent or is currently studying. The Fact Grid shows the student's fluency status for each fact in the assigned operation. The Fact Grid displays all the facts in the operation and fact range the student is assigned. Facts are presented in three states:

1. Fast Facts—are facts that the student can answer correctly in 0.8 seconds or less. The student demonstrated fluency with these facts in either the Placement Assessment or a subsequent program assessment.
2. Focus Facts—are the facts the student is currently working on. The student received instruction on these facts and he or she can provide a correct answer in 1.25 seconds or less.
3. Study Facts—are non-fluent facts. The student repeatedly gave slow or incorrect responses to these facts during the Placement Assessment, and the facts have not yet been presented for instruction.

Assessments

FASTT Math includes several periodic assessments that check student progress continuously and adjust instruction accordingly.

- Mastery Assessments determine if a student has developed fluency with the group of math facts presented in the software. Students participate in these assessments depending on how many facts they need to master, and how much time they have spent on the software and the lessons they have completed. After every 60 minutes of instructional time spent on the software, this tool determines which Focus Facts students can retrieve in .8 of a second or less.
- Challenge Assessments show whether the student is able to respond fluently to facts that will be presented in the next level. Students may have been tested on these same facts in the Placement Assessment. The Challenge Assessments account for what the student may have learned and the fact fluency they may have gained outside of using the software.

- The Special Challenge Assessment is presented when a student moves from the 0-9 to the 0-12 number range within the same operation. The purpose is to evaluate fluency of newly assigned fact in the 10s, 11s, and 12s.

Through the *Scholastic Achievement Manager* (SAM) teachers and administrators can generate reports on individual students, groups of students, an entire class, a grade, the whole school, or district. Reports provide information on a variety of performance measures, including fact fluency status, progress, and response to intervention, among others. In addition, SAM will alert teachers when it identifies a problem, like low usage or slow progress, or when there is reason to celebrate, like achievement of a new level in fact fluency.

Motivation and Engagement

The *FASTT Math* student software leads the student through a linear path of instruction and assessment. As part of the daily lesson, the student will be given a customized assignment; for example, to study new facts. In addition, the student will be required to complete one practice game per day; the practice game focuses only on learned facts. Each lesson should take about ten minutes to complete. *FASTT Math* has nine engaging practice games of two different types, as follows:

- Game Type One: Five objects move continuously from one end of the screen to the other. Each object is linked to a math fact. The goal of the game is to answer each fact as fast as possible to keep the objects from reaching the other end of the screen. Correct responses are awarded points.
- Game Type Two: Three facts are linked to one object moving from one end of the screen to the other. The faster the student answers each fact the faster the object moves. Correct responses are awarded points and bonus points.

When students are learning new facts or playing a game in *FASTT Math*, they are rewarded with points. Students feel a deep sense of accomplishment as they master math facts and watch them recorded on the *FASTT Math Fact Grid*. Students compete with their own previous scores, which focuses them on progressive self-improvement. When a student reaches a new level in the software, the *FASTT Math Manager* notifies the teacher, who can print an award certificate.

Differentiated Instructional Strategies

The *FASTT Math* system delivers individualized instruction and targeted practices that address the diverse needs of all students. With adaptive technology, independent practice, and the additional interventions included in the *Fact Fluency Foundations Guide*, the gaps in each student's number knowledge are identified and filled. Moreover, the assessments and reports embedded in the program promote the practices of screening students, identifying those who require support in developing fact fluency and providing the exact instruction that each one needs, offering ongoing progress monitoring, and producing actionable reports.

Strategies for English-Language Learners

FASTT Math includes many support strategies for English-Language Learners. The 1.25-second monitored response time can be lengthened to allow more time to respond. The number of problems presented during instruction can be reduced for students who need more time to absorb new information. The audio function can be turned on or off. Students can listen repeatedly to any instructions they may have missed. Problems can be spoken aloud in English and Spanish.

Strategies for Special Education students

The *FASTT Math* technology is completely adaptive, keeping students of all abilities at the achievable edge of their capabilities. The print components of the program are similarly designed to guide the teacher to focus on explicit learning gains within the reach of each student. The *FASTT Math* program technology includes Universal Design features that help math-delayed students develop mathematical fluency. Within the Software instructions, minimal screen text reading is required and audio instructions

are provided for each student activity. The initial Typing Assessment measures a baseline of student keyboarding skills so that this measure is distinct from the measure of fact recall. Teachers can control response time limit allowed for student to demonstrate fact latency. Two color contrast settings can be set for visually challenged students.

To support a range of learning styles, the *FASTT Math* software presents facts in multiple formats—orally (narrated), symbolically (e.g. $3+4=7$), and graphically (using 10-frames in addition and subtraction and arrays in multiplication and division). In addition, *FASTT Math* allows the teacher to adjust the settings of the program to accommodate other learner differences. The 1.25 second monitored response time can be lengthened for students with processing deficits. The number of problems presented during instruction can be reduced for students who need more time to absorb new information. Problems can be spoken aloud, in English or Spanish, for visually impaired students (and to build an oral memory connection with each fact). Finally, visually impaired students are supported with two high color contrast settings for the screen display.

Home-School Connection

A Parent Letter, available in English and Spanish, explains the goal of the *FASTT Math* program, steps children will be completing as they learn, and ways to reinforce their learning at home. Teachers can share with parents the Student Fact Grid report, which displays the student's fluency status with all facts in the operation. Teachers can print Award Certificates as students complete different levels of the fact grid. The certificates can be shared with parents and uses as examples of student achievement. Also, customized worksheets can be generated that students can bring home as part of the homework that parents can support

Professional Development

Scholastic will provide a half-day in-person implementation training for teachers. This training examines how *FASTT Math* teaches automaticity and fluency and provides teachers with all the tools to successfully get started with the program. Participants learn how to implement the *FASTT Math* instructional model, use report data to monitor progress and individualize instruction, and integrate *FASTT Math* into the existing mathematics curriculum. Supplemental full-day trainings, as well as coaching days are available for an additional cost and will be integrated into the implementation calendar.

The *FASTT Math* program also includes a wealth of professional development materials with the purchase of the program. The *FASTT Math Teacher's Guide* provides strategies for effectively implementing the program and using software-generated reports to monitor and manage student progress. The *Fact Fluency Foundations Guide* offers concrete guidelines and resources for assessing and addressing student's needs in understanding number sense and operations. The *Research Foundation & Evidence of Effectiveness for FASTT Math* presents the research-based principles behind the program and data that shows how effective *FASTT Math* is in increasing math fact fluency.

 For additional information about *FASTT Math*, visit www.fasttmath.com.