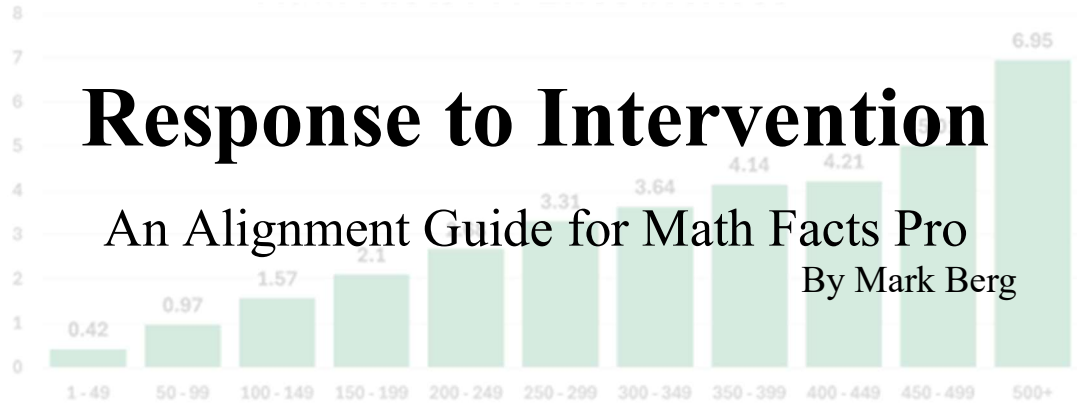



# Response to Intervention

## An Alignment Guide for Math Facts Pro

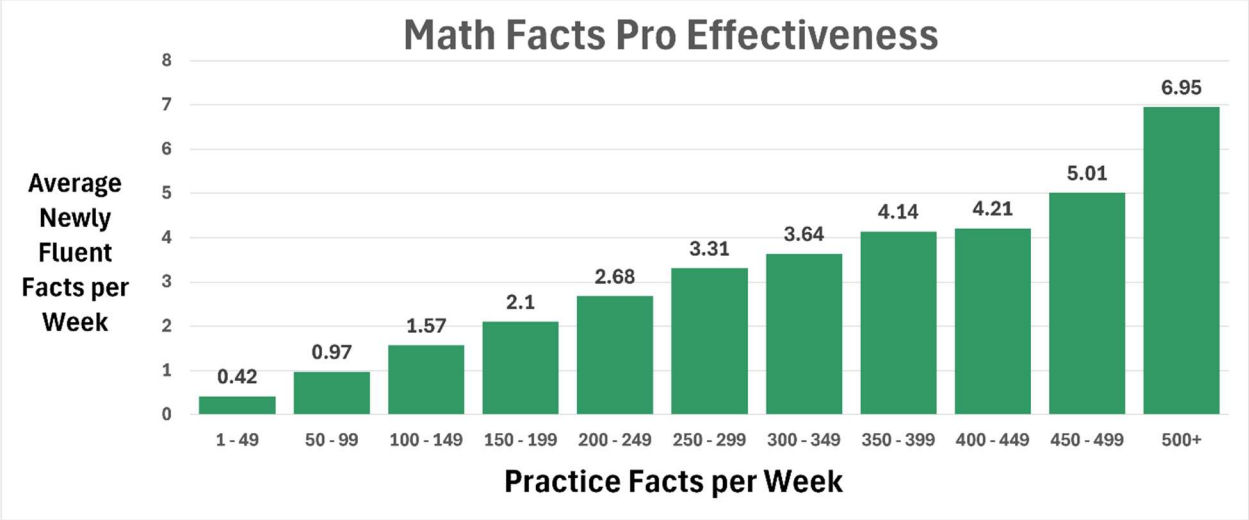
By Mark Berg

**Program Description:**

The online program Math Facts Pro (MFP) is an intelligent tutor designed to help students in first grade and up achieve fluency (automaticity) in the basic math fact combinations. This moves the brain's fact processing out of working memory so the student can use it to focus on problem solving and learning new concepts and skills (Geary, 1994). The following is a list of some of its features:

- Instant correct feedback. Students immediately know if they were correct or incorrect, but they never see an incorrect answer. Multiple choice is not used, so the student must create, not simply recognize, the correct answer.
- Individualized fluency Speed. MFP determines the fluency response speed of each student, simply by assuming that their fastest average correct responses are for facts that are fluent. This allows MFP to distinguish between counting or skip counting and automatic response. It knows if a student counted.
- Appropriate difficulty level. The next fact to be asked is determined by both past performance and how a fact relates to known and unknown facts so that practice is neither too easy nor too hard, for an average fluency of 90% to 95%, similar to the instructional level in reading (Partnership for Reading, 2001). This results in focused practice on the facts that are the closest to fluent for that student, for maximum effectiveness (Hasselbring et al., 2006).
- Spaced repetition. Facts to be learned are introduced one at a time, and are moved from short term memory into long term by slowly extending the time between each successive automatic recall (spaced repetition).
- Printable results. It is easy for both the student and the teacher to see which facts are fluent today, and how the student is progressing. Teachers can see when intervention is needed, and which fact the student is stuck on.
- Usage monitoring. Teachers can see how much students practiced the previous day and current week, and hold them accountable for practicing.
- Games. Our first optional game is Mars Defense, which provides intense focused practice. Students who play it average an extra 60 facts per session, just because they want to, for fun.

**Research / Effectiveness**
Math Facts Pro has been shown to be very effective at helping students become fluent with the basic math facts. An October 2026 study showed that the average student practicing 250 facts/week (about 5 minutes a day) learns about 7 times as much as one practicing under 50 facts/week.




**Population:** Included in this study were all students who logged-in and practiced, totaling more than 56,000 students over 500,000 student-weeks.
**Fluency:** Each student's fluency speed is unique. It is determined by their fastest average response times. Facts were considered to be fluent if they were answered correctly and fast enough for the given student's speed every time, or with only one miss if attempts were > 3 and < 11, or for 9 out of the last 10 attempts if attempts were > 10. Facts were counted as newly fluent if they were not fluent on the very first response, but later became fluent with practice.
**Deductions:** On average, students who used Math Facts Pro very little (less than 50 facts practiced/week) learned 0.42 new facts/week, while students who used Math Facts Pro about 250 facts/week learned about 7 times as many – an average of 3.31 new facts per week. Nothing else was controlled. While it is possible that teachers/parents who caused their students to practice more were also more effective, it is likely that for many the only difference was the extra practice with Math Facts Pro.

# Response to Intervention

## Tier 1

The primary prevention level of instruction includes a research based core curriculum, universal screening to determine students' current level of performance, differentiated learning activities, and accommodations.

Math Facts Pro's practice is research based and effective. It gives teachers the ability to continually monitor both current performance, including which facts, and how many, are currently fluent. The practice is differentiated and accommodates each student's speed as well as knowledge, ensuring success with practice that is not too easy, nor too hard. Math Facts Pro targets the following Common Core Standards:

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.

2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, so one also knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

## Tier 2

The secondary prevention level typically involves adult led small group instruction, is evidence-based, and involves a clearly articulated, validated intervention.

Math Facts Pro provides the teacher with the information necessary to group students according to which facts they are practicing. For example, a teacher can quickly see who is working on $3 + 4$, pull those students into a group, and help them find a way to remember it. She can also quickly see which students have not made any progress, and therefore likely need help understanding the concept of the operator. As shown above, MFP has demonstrated that it is a valid intervention. Features include: 1) The intelligent tutor adjusts the difficulty to achieve a 90% to 95% fluency rate during practice. 2) Students who have difficulty remembering what they learned the previous day receive additional practice to help them achieve permanent fluency. 3) MFP has many mnemonic videos to provide an extra memory hook.

## Tier 3

The tertiary prevention level is a more intensive version of the secondary level, using smaller groups and longer or more frequent sessions. It involves at least weekly monitoring of progress.

Math Facts Pro gives the teacher the information needed to intervene directly. Teachers can see at a glance which students have plateaued in their learning, and which facts are causing them trouble. Frequent practice is the key, and teachers can assign practice both in school and after school, and can easily log-in in the morning to see if the practice was done the previous evening.

# Summary

At only $1/student/year, we think you will find Math Facts Pro to be the least expensive research and evidence based approach to developing math fact fluency, and well capable of meeting your RtI needs. However, as the research shows, its effectiveness is directly tied to the quantity of practice. That's why it is designed to help teachers monitor not just progress, but amount of practice. We hope that you will give it a try today for free at MathFactsPro.com.

## Author

Mark Berg taught grades 3, 5, 6, and 8 for a total of 13 years. He has a master's degree in Instructional Design and Technology from Emporia State University, and has been researching, designing, and developing MathFactsPro.com since 2008.

## References

Fosnot, C . T ., & Dolk, M . (2001) .Young mathematicians at work: Constructing number sense. Westport, CT: Heinemann

Geary, D. C. (1994). Children's mathematical development: Research and practical applications. Washington, DC: American Psychological Association.

Hasselbring, T. S., Lott, A. C., and Zydney, J. M. (2006). Technology-supported math instruction for students with disabilities: Two decades of research and development. Washington, DC: CITEd, Center for Implementing Technology in Education

Partnership for Reading (2001). Fluency: an Introduction. Retrieved September 11, 2013, from http://readingrockets.org