

## ***The Science behind Scientific Learning's Product Placement Recommendations***

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The Scientific Learning product line comprises reading intervention software products that are proven to build the cognitive, linguistic, and literacy foundations for becoming a skilled reader. As the Scientific Learning product line has expanded<sup>1</sup>, educators have increasingly requested guidance in designing product sequences that are appropriate for their students. In response, Scientific Learning now provides detailed placement recommendations tailored to students with diverse needs. The recommendations are differentiated and informed by performance measures and other student characteristics, so that educators can plan efficient and effective reading interventions for each student.

In Scientific Learning's current recommended placement model, some students are directed to begin with one or more products from the Fast ForWord LANGUAGE or LITERACY series, while other students are directed to bypass these products and begin with products in the Fast ForWord READING series<sup>2</sup>. The current model supersedes an earlier one, in which all students were advised to complete the LANGUAGE or LITERACY series before moving on to the READING series.

The earlier recommended placement model was based on findings from an extensive body of research on the first Fast ForWord products. This research showed that a wide variety of students can make substantial, lasting gains in reading and language skills after using products from the LANGUAGE or LITERACY series (for more information, see

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<sup>1</sup> As of 2009 the Scientific Learning product line includes eleven Fast ForWord products, plus Reading Assistant Expanded Edition software.

<sup>2</sup> The scope of this paper is limited to the revised placement recommendations for the Fast ForWord products. However, it should be noted that the current placement model has also been expanded to include Scientific Learning Reading Assistant Expanded Edition software. This software provides guided oral reading practice, a research-validated approach for building reading fluency skills (NICHHD, 2000), along with vocabulary-enrichment and comprehension-building activities.

<http://www.scilearn.com/results>). However, as the Fast ForWord family of products grew to include the Fast ForWord READING series, new research was needed to identify the best instructional paths for individual students.

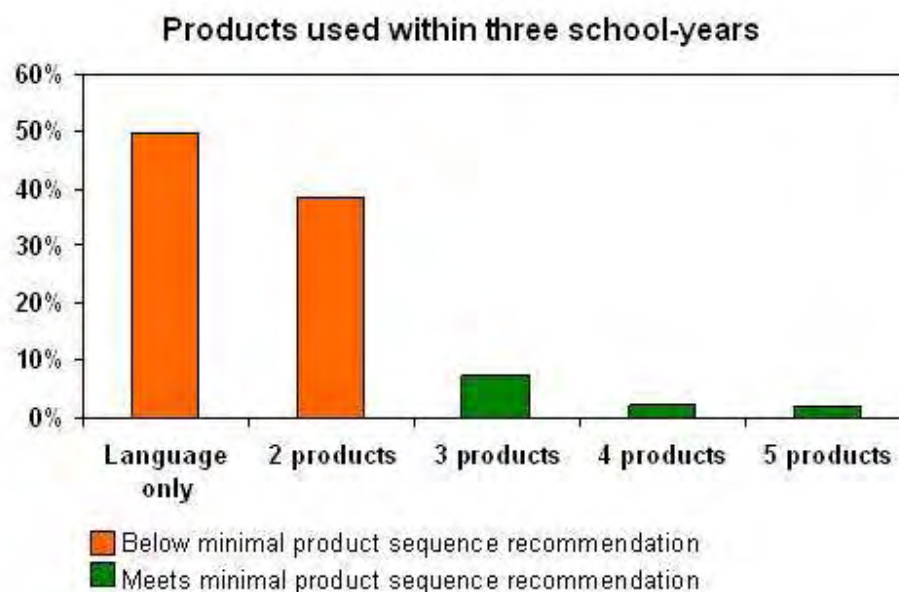
While the earlier model could be characterized as a single-path approach to placement, the current model takes a differentiated approach. Differentiated instruction involves tailoring teaching approaches, materials, and activities to individuals in order to improve learning among students with different skills and backgrounds. This approach has received research support, and is increasingly viewed as an educational “best practice” (Tomlinson, 2000; National Research Council, 2004; TEA Best Practices Clearinghouse, 2006).

Compared to a single-path approach to product placement, a differentiated approach is more compatible with the neuroscience-based learning principle of adaptivity. Adaptive learning environments provide each student with the right balance of challenge and success to promote motivation and mastery. While all of the Fast ForWord products are adaptive, specific products will provide a better overall level of challenge for specific students. Thus, initially placing students into the right product helps ensure that each student experiences an optimal learning environment. To develop an improved product placement model, research was conducted to examine how the Fast ForWord products were being used in the schools, whether different approaches would be effective, and how specific products impacted various student populations.

The earlier model recommended that most participants begin with Fast ForWord Language or Fast ForWord Middle & High School (the precursor to Fast ForWord Literacy). After completing this initial product, each participant was directed to progress through a sequence of products, ultimately completing one or more products from the Fast ForWord READING series, in order to bring reading skills up to grade level. This model required that most participants complete a sequence of three to five products.

To examine the product sequence actually followed by typical Fast ForWord participants, a random sample of 656 Fast ForWord Language users was drawn from a

pool of more than 65,000 participants who began using Fast ForWord Language during the 2005-2006 school year. Their use of all Fast ForWord products was followed for a period of three school years<sup>3</sup>. The number of products used was tallied for each participant and the results of this analysis are shown in Figure 1.



*Figure 1. Percent of students who used between one and five Fast ForWord products for at least 5 days, over a period of three school years. This analysis includes 656 students who used Fast ForWord Language during the 2005-2006 school year. The orange bars primarily represent students who used Fast ForWord Language only, or Fast ForWord Language followed by Fast ForWord Language to Reading. The green bars represent students who also used at least one product from the Fast ForWord READING series.*

The participants used an average of 1.7 products. The vast majority of participants used Fast ForWord Language alone or followed by Fast ForWord Language to Reading. Only 13% of the participants in this sample used any of the Reading products within the three year study period. This analysis indicated that relatively few participants were actually using the full product sequence recommended by the earlier model. The fact that the majority of participants were only completing one or two products suggests that

<sup>3</sup> This analysis included all Fast ForWord products started between August 1, 2005 and June 30, 2008, with the exceptions of Fast ForWord Language Basics and products that were used fewer than 5 days. Fast ForWord Language Basics is typically completed in a few days and is not counted as one of the three to five products in a recommended sequence.

participants should be placed into the product that can offer the most benefit in the least time – a differentiated placement approach.

Additional analyses were done to test the differentiated approach to placement. Are there students who could do as well, or better, by skipping the earlier products and starting directly on the Fast ForWord READING series? One hint that such students exist came from looking at the variability in Fast ForWord product completion rates. According to the recommended Fast ForWord Language 50-Minute Protocol, participants working 5 days per week should complete the product in 6 to 10 weeks. In practice, however, a substantial number of participants using this protocol have completed the product in less than 5 weeks (see table 1). Many of these participants may have derived greater benefit had they been placed in a more advanced Fast ForWord product that was appropriately challenging.

Duration of Product Use	Number of Participants	Percent of Sample
Less than 15 days (<3 weeks)	179	1.5%
15-19 days (~3-4 weeks)	1632	13.3%
20-24 days (~4-5 weeks)	2637	21.4%
More than 24 days (>=5 weeks)	7848	63.8%

*Table 1. Variability in completion rate among Fast ForWord Language participants. This data comes from 12,296 participants below the age of 19 who started using Fast ForWord Language in 2007, and who received a “Switch” or “Complete” flag in Progress Tracker (Scientific Learning’s online reporting tool), indicating mastery of most of the content in a product. For the purposes of this analysis, a week is defined as 5 days of product use.*

Several studies have demonstrated that students can benefit from using the READING series products without prior use of the LANGUAGE or LITERACY series products (Scientific Learning, 2007a, 2007b, 2007c). This set of studies included more than 250 students in kindergarten through eighth grade. The students were administered nationally-normed, standardized reading tests before and after using one or more products in the READING series. The results showed that students who started in the READING series made significant gains on a variety of reading assessments as shown in

Table 2. Improvements in phonological awareness, letter and word identification, word analysis, vocabulary, and reading comprehension were seen in these studies.

Fast ForWord Product	Significant Gains	Assessments used in studies
Reading Prep	√	Woodcock-Johnson – Revised: Tests of Achievement
Reading Level 1	√	Test of Phonological Awareness
Reading Level 2	√	Gates-MacGinitie Reading Tests
Reading Level 3	√	Terra Nova Comprehensive Tests of Basic Skills, Survey Plus
Reading Level 4	√	Gates-MacGinitie Reading Tests
Reading Level 5	√	Gates-MacGinitie Reading Tests

*Table 2: Products and assessments are listed that were used in studies testing the efficacy of Fast ForWord READING products for students who have not used Fast ForWord LANGUAGE or LITERACY products. A checkmark indicates that statistically significant improvements were seen on these measures after Fast ForWord use ( $p < 0.05$ ).*

The studies and analyses described above provided empirical support for developing a differentiated product placement model. The next step was to develop an effective set of recommendations, within a framework that could be efficiently implemented. To do so, multiple sources of data had to be considered. The current model is informed by the educational content and design of the products, empirical data about Fast ForWord participants, recommendations from education experts, and feedback from Fast ForWord implementation experts.

Specific placement recommendations are determined by four factors characterizing the participant: assigned grade, discrepancy between grade level and reading level, classification with regard to services for English language learners (ELL), and classification with regard to special education services (SE). Discrepancies between grade level and reading level are broken into three performance bands: “near grade level” (reading within half a year of grade level); “falling behind grade level” (half a year to one and a half years behind); and, “substantially below grade level” (more than one and a half years behind).

The performance bands help characterize the nature and severity of a student’s skill deficits. This information is used in the placement model to provide different interventions to students with different needs. Support for this approach is provided by an analysis done with more than 15,000 students who took the Reading Progress Indicator (RPI) assessment and then used a product in the Fast ForWord READING series<sup>4</sup>. For the purpose of this analysis, each student was assigned to a performance band by comparing the grade equivalent earned on RPI to the assigned grade at the time of testing. Fast ForWord usage data was analyzed for the students in each performance band to determine how they responded to the products. Averages for each group are summarized in Table 3.

The analysis revealed significant differences between the three groups. Students in the “near grade level” performance band had the best response to the assigned READING series products, across all measures. They were highest in days of use, participation, and attendance, suggesting that this group was appropriately challenged by the READING series products they used. Students in the “falling behind grade level” band were only

Performance Band	Number of Students	Days of use	Attendance	Participation	Percent Complete	Completion Rate (per hour)
Near grade level	3998	26.3	75.4%	94.5%	75.2%	5.9%
Falling behind grade level	5373	24.6	74.5%	93.6%	71.4%	5.8%
Substantially below grade level	5802	20.3	71.2%	85.3%	52.3%	4.3%

*Table 3. Average usage of Fast ForWord READING series products for students in the following groups: “near grade level” (reading within half a year of grade level); “falling behind grade level” (half a year to one and a half years behind); and, “substantially below grade level” (more than one and a half years behind). For this analysis, participants were grouped on the basis of the discrepancy between their actual grade level and their reading grade equivalent on the Reading Progress Indicator assessment.*

slightly lower in days of use, participation, and attendance. Relative to the highest band, this group completed significantly less total content, but their rate of completion was

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<sup>4</sup> The product assignments for students in this analysis were made by educators at their schools or by clinical professionals, and may or may not have been informed by Scientific Learning’s placement recommendations.

not significantly different. This suggests that these students are capable of mastering content in the Reading series, but that they may benefit from a lower entry point within the series. The “substantially below grade level” group had markedly lower performance across all measures than the other groups. Their reduced days of use, participation, and attendance may indicate that these students were overly frustrated by the READING series products they had been placed on. On average, the participants in this band showed low completion rates and low total completion, factors that prior research has linked to poor outcomes. This pattern of results suggests that students in the “substantially below grade level” band may not be prepared to begin with the READING series, and would derive greater benefit from beginning with the LANGUAGE or LITERACY series.

For students without specific risk factors, placement recommendations are entirely based on assigned grade and performance band. Students reading near grade level should be placed directly into the READING series, with a sequence of products that will consolidate and reinforce reading skills near their current level, and quickly move them into more challenging material. Students falling behind grade level should start lower in the READING series<sup>5</sup> for more basic-skill building. Students substantially below grade level should start with the LANGUAGE or LITERACY series to remediate deficits in the cognitive and linguistic prerequisites to skilled reading.

While all placement recommendations are based primarily on assigned grade and performance band, students with an ELL or SE classification are considered to have additional risk factors. Different product recommendations are made to address the characteristic needs of students in these populations. Students with an ELL classification, but strong English reading skills, will start with the first product within the LANGUAGE or LITERACY series, and will then proceed directly to the READING series. This path addresses the need of most ELLs to develop better skills in English phonology and grammar, and then quickly moves the students to work on their reading skills at an

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<sup>5</sup> Younger students in the “falling behind grade level” category may be effectively at a pre-reading level, in which case they should start with Fast ForWord Language.

appropriately challenging level. Students with an SE classification typically need more extensive work on language and cognitive skills, and so their product recommendations include the entire LANGUAGE or LITERACY series, followed by products in the READING series. This path is also recommended for ELLs who have an SE classification and ELLs with low reading skills.

As students progress along their own developmental trajectories, their needs will change, so placement is only the first step in planning an effective and efficient educational pathway. Progress monitoring is necessary to identify when students should be moved to the next product in a sequence, or when a product sequence should be revised. Scientific Learning offers a variety of tools and services to support schools in monitoring student progress. For example, the flags in Scientific Learning's online reporting tool, Progress Tracker, provide high-level, rapidly-accessible information to support making timely educational decisions. The Switch flag will appear when a student is ready for the next product in a sequence; the Intervene flag will appear when a student is in need of assistance on the current product; and the Redirect flag will appear when a student is likely to derive more benefit from a lower level product.

The current placement model accounts for some of the most important sources of information about student abilities and risk factors. Still, it does not address every factor that might affect a student's instructional needs. The recommendations of the model are not intended to override the judgment of experienced educators or clinicians who may have a more complete picture of the students they work with.

Scientific Learning has developed the current placement model on the basis of the best research to date. The model may be revised in the future, as new studies provide further insight into how learners with various learning characteristics respond to different product sequences and product combinations. The recommendations derived from the current placement model are detailed in the Scientific Learning *Product Use*



*Chart for Struggling Readers*<sup>6</sup> and the Scientific Learning *Product Use Chart for Early Learners*<sup>7</sup>. The charts are implementation tools designed to help ensure that schools maximize the reading improvements of their students. With this support, educators can provide students with appropriate, differentiated instructional paths through the Fast ForWord and Reading Assistant Expanded Edition products.

Notes:

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<sup>6</sup> Scientific Learning Corporation (2009). *Product Use Chart for Struggling Readers*. Oakland, CA: Author. This document is available to Scientific Learning customers with active support agreements at: <http://www.scilearn.com/alldocs/training/40398ProdUseChart.pdf>

<sup>7</sup> Scientific Learning Corporation (2009). *Product Use Chart for Early Learners*. Oakland, CA: Author. This document is available to Scientific Learning customers with active support agreements at: <http://www.scilearn.com/alldocs/training/40401ProdUseChartEarly.pdf>

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