

## Data is More Than Just Numbers: Using Daily Fluency Records to Monitor Student Progress

### Overview

Reading fluency is defined as “the ability to read with sufficient ease and accuracy that one can focus attention on the meaning and message of text” (Adams, 2002). Because non-fluent readers devote much of their attention to decoding words, they have less cognitive resources available to apply to comprehension. Accordingly, effective teachers must apply systematic classroom-based instructional assessments to monitor student progress on both their reading rate and accuracy in order to modify instruction to suit individual student needs.

The Livescribe smartpen addresses many of the limitations associated with conventional data collection, analysis, and reporting of reading fluency.

Conventional Approach	Livescribe Approach
Paper record	Paper record w/automatic electronic copy
Separate timer; potential student anxiety	Unobtrusive timer built into pen display
One-time opportunity for data scoring	Recorded audio allows for multiple reviews
Handwritten marks for future reference	Handwritten marks with audio record
Face-to-face training and practice	Smartpen-based training and practice

Table 1: Comparison of conventional and Livescribe approach to fluency assessment.

### Background

Reading fluency is frequently assessed by counting the number of words a child can read correctly in one minute. Because errors take time, measuring fluency in correct words per minute provides an objective measure that can be used to monitor reading development over time. Educational researchers generally agree that one-minute timed readings are sensitive, reliable, and valid of measures of reading proficiency (Marston, 1989). Another benefit of this form of assessment compared with other reading measures is that it is easy and efficient for the teacher.

The reliability of the approach can also be enhanced through standardized, unobtrusive procedures. For example, the teacher should sit apart from the student and hold her clipboard in a position where the student is not distracted by the process of recording responses. Furthermore, a digital timer should be used rather than the common “ticking” kitchen timer. Despite the use of these, as well as other commonly-used techniques, there

are still recognized problems associated with inter-rater reliability. The reading of a word that one teacher finds acceptable, may be found unacceptable to a different teacher.

### **Fluency Measures for Developing Readers**

As a learner progresses through a domain of knowledge to increasingly more complex levels of performance, lower level skills are practiced to automaticity—they are performed with little or no perceptible mental effort. In reading, very young children must focus on simply recalling letter shape and name correspondences. They are at the level where they must determine whether the “stick” attached to the “ball” forms a “d,” “p,” “b,” or “q.” Once they are able to quickly and confidently name letters, they can focus their efforts on discovering how each letter (or groups of letters) combine to form sounds called phonemes. Groups of phonemes are combined to produce words, groups of words are combined to form sentences, and groups of sentences are combined to form paragraphs...and so on.

Fluency measures ensure that subskills are learned to the degree required to make available the cognitive resources necessary to decipher the next higher level in the reading hierarchy. As a result, fluency tests can be given for letter/sound fluency, word identification, and passage reading. For the purpose of this Teacher Activity guide, the Passage Reading Fluency (PRF) assessment will be used as the example. The methods described could apply to any fluency measure, however.

#### *Passage Reading Fluency*

PRF is administered on a one-to-one basis. In the typical approach, the student is provided a developmentally-appropriate reading passage. The teacher has an identical copy of the passage but with a cumulative count of the number of words in the right hand margin of the page. The numbers on the teacher’s copy allows her to quickly calculate the total number of words read in one minute.

Fuchs, Fuchs, Hamlett, Walz, and Germann (1993) identified typical performance for developing readers as follows:

4th grade	.....	25th percentile, 100wpm
		50th percentile, 125wpm
5th grade	.....	25th percentile, 110wpm
		50th percentile, 140wpm
6th grade	.....	25th percentile, 130wpm
		50th percentile, 160wpm

## Fluency Data Collection with the Livescribe Smartpen

The most effective educational technologies are those that require little (or no) behavioral change on the part of the learner or the teacher. The procedure using the Livescribe smartpen is *identical* to the conventional approach—but yields significant benefits.

### Preparation for the Test

Prior to administering a fluency test, the teacher should tear a page out of her Livescribe spiral bound notebook and print out or copy onto it a version of the student's passage. (*Note:* Notebook paper can be fed through a printer or photocopier like regular copier paper.)

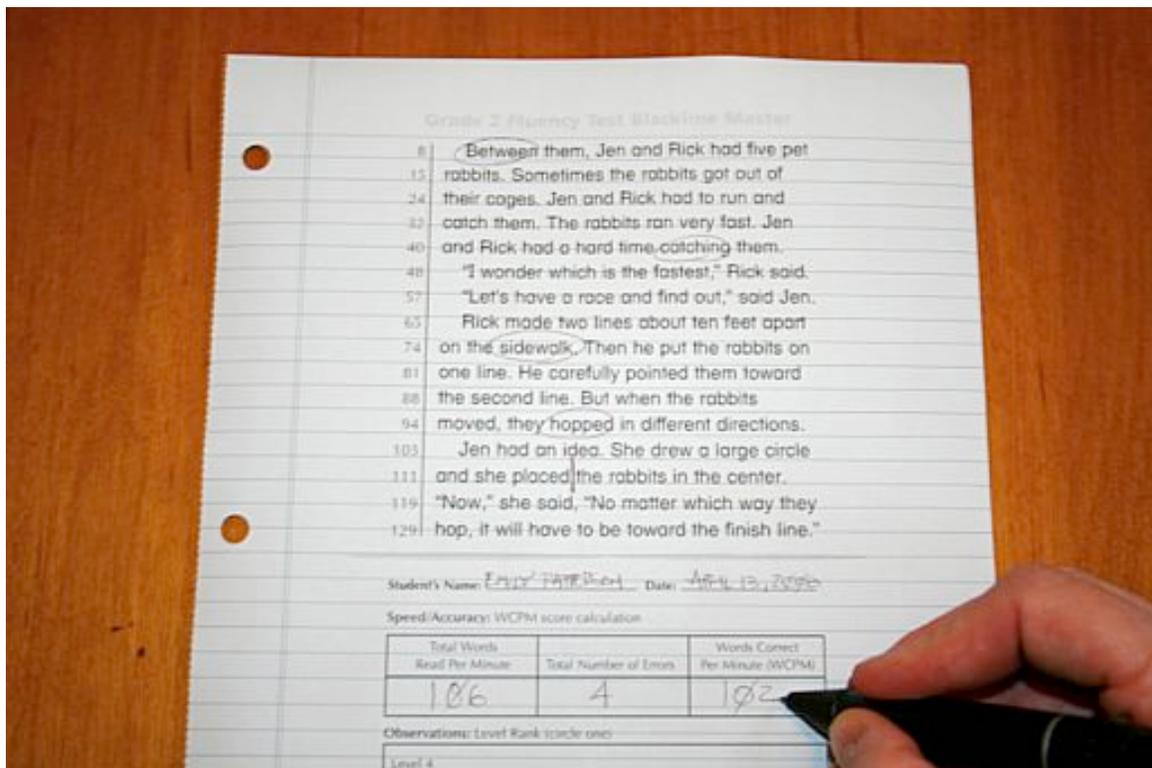


Figure 1: *Rigby Reads* fluency test printed onto Livescribe notebook paper.

### During Test Administration

1. Turn the Livescribe smartpen on.
2. Write the student's name, the date, and the time at the top of the teacher's copy of the reading passage.
3. Ask the student if they are ready to begin. If they are, proceed to the next step.
4. Tell the student that you would like them to begin reading when they hear the smartpen make a "beep" sound.

5. Tap the Paper Replay *Record* button (which automatically makes a “beep” sound) and then make a check mark next to the first word in the passage. (Alternatively, you can tap the *Record* button and say “Begin” at the same moment.)
6. Administer the test as you normally would—marking each mistaken word according to the type of error made (substitution, omission, hesitation, repetition, insertion, correction, or transposition).
7. Monitor the time on the smartpen’s display. When it reaches the one-minute point, draw a vertical line immediately after the last word spoken. Say “Stop” and then tap the Paper Replay *Stop* button.
8. While the smartpen is still turned on, calculate the score and write it on the page with any other appropriate notations. (Marks made on the paper while the pen is turned on are stored in memory and transferred to the *Livescribe Desktop*.)
9. Turn the smartpen off.

### **Following Test Administration**

Although the administration of the test is identical to the conventional approach, a number of advantages are gained by recording data with the Livescribe smartpen:

- The teacher can review the passage one or more times to ensure that errors were correctly counted and categorized—increasing the reliability of the assessment. (This self-correction also serves as training to improve the accuracy of the teacher in subsequent tests.)
- A supervising teacher can also review the audio recording, comparing it with the handwritten marks and final score, for the purpose of training and evaluation.
- Once the pen is docked to the teacher’s Mac or PC, the data is uploaded as an electronic record to the *Livescribe Desktop* software. This desktop copy can be reviewed later as a pencast or printed out if the original version is lost.
- The teacher can also play the recording back for the student so they can hear themselves reading. Students are often so focused on reading they do not hear their own mistakes, intonation, or other reading qualities that are the focus of instruction.
- With practice, it may be possible for some student to conduct their own fluency tests. In this approach, the student would tap the Paper Replay *Record* button and read the passage aloud for one minute (without making any marks on the paper except to designate the final word read). The student would then replay the audio recording as many times as is necessary to identify all the errors. They would then calculate and make note of their final fluency score. The teacher, of course, could spot check student records to ensure accuracy.

## References

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