What is the Science of Reading?

There are many definitions of the term *Science of Reading* (SOR). *The International Literacy Association* (ILA), the largest professional organization serving literacy needs in schools, defines the *Science of Reading* as:

> "a corpus of objective investigation and accumulation of reliable evidence about how humans learn to read and how reading should be taught."
>
> *International Literacy Association, 2020*

The *Science of Reading (SOR)* is based on a corpus or collection of research studies that describe the cognitive or mental processes that underlie how humans learn to read. On the other hand, the *Science of Reading Instruction (SORI)* is based on a collection of classroom and school-based research studies that validate how reading is effectively taught in schools and classrooms. See below:

Examples of What We Know from the Science of Reading
• The ability to hear individual speech sounds or phonemes (e.g. that "hat" consists of three different sounds or phonemes) is strongly related to acquiring reading ability (Willingham, 2017) • The more children encounter a word through reading, the stronger the mental representation of that word in the brain (Willingham, 2017) • Students need to be able to read individual words automatically and effortlessly to improve their reading performance (Willingham, 2017) • Good readers quickly decode unknown words when reading, while poor readers tend to rely more on guessing unknown words (Seidenberg, 2017) • Students who have extensive background knowledge are better able to comprehend texts (Wexler, 2019)

Examples of What We Know from the Science of Reading Instruction
Instruction should include: • Explicit and systematic phonics instruction for beginning readers (Willingham, 2017) • Many opportunities to practice reading daily to become proficient (Seidenberg, 2017) • Oral repeated reading to help students develop into fluent readers (NRP, 2000) • Decoding unknown words rather than guessing for beginning readers (NRP, 2000)

The Report of the National Reading Panel (NICHD, 2000) and the Report of the Early Literacy Panel (NIL, 2008) provide a synthesis of strong scientific evidence for teaching a collection of reading foundation skills to young students as well as vocabulary and comprehension strategies leading to proficient reading ability. Another excellent source of *Science of Reading* information is found in a recent compilation of *Science of Reading* findings entitled, "How the Science of Reading Informs 21st-Century Education," in *Reading Research Quarterly* (Petscher, et al., 2020). Three excellent books on SOR include: *Reading in the Brain: The New Science of How We Read* (Dehaene, S. 2009); *Language at the Speed of Sight: How We Read, Why So Many Can't, and What Can Be Done About It*" (Seidenberg, 2017); and *The Reading Mind: A Cognitive Approach to Understanding How the Mind Reads* (Willingham, 2017).

Taken together, these reports, articles and books describe the instructional elements included in the *Science of Reading Instruction* as shown below:

- **Oral Language Skills**
- **Concepts of Print**
- **Phonological Awareness**
- **Phonemic Awareness**
- **Alphabet Letters and Sounds**
- **Phonics**
- **Morphological Analysis**
- **Spelling**
- **Fluency**
- **Vocabulary Development**
- **Background Knowledge**
- **Comprehension Strategies**
- **Text Discussion**
- **Writing**

In order to animate SOR and SORI findings in classroom instruction, K-12 teachers must know how to assess commercial instructional reading materials and programs to determine the

extent to which they are consistent with the SOR and SORI research base. District and school adopted instructional materials and programs can be aligned with SORI and when necessary they can be augmented, eliminated, or adapted. If a teacher or school is currently employing commercially published reading instructional materials and programs, then steps should be taken to align the focus of the reading instruction in these programs with the *Science of Reading Instruction* (SORI) research base.

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