

Neurodiversity and the Science of Reading:

Specific Considerations for Special Educators

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What is the Science of Reading?



- Collection of research from multiple fields of study that confirm and reject theories on how children best learn to read.
- Evidence-Based practices for instruction
- Ever-growing



- A program, curriculum, or product you can purchase.
- Only focused on phonics instruction
- Complete or finished in its findings



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What is the Science of Reading?

Word Recognition

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Language Comprehension

=

Reading Comprehension

Many Strands Are Woven into Skilled Reading



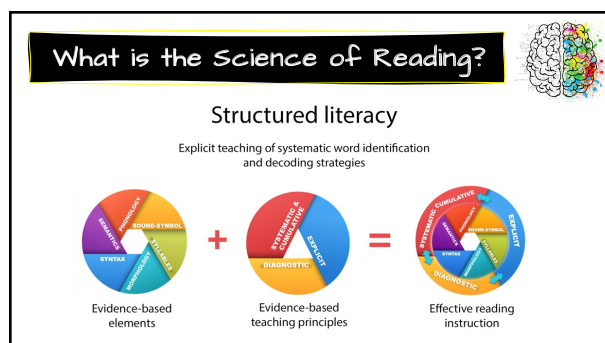
Skilled Reading

From acquisition and consolidation of language comprehension and word recognition

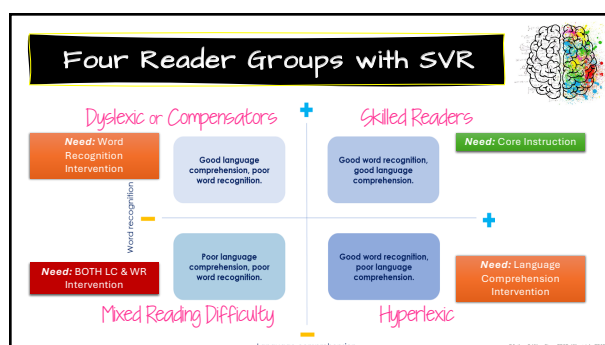
Report 1.2 Reading Road (Guthrie, 2012)
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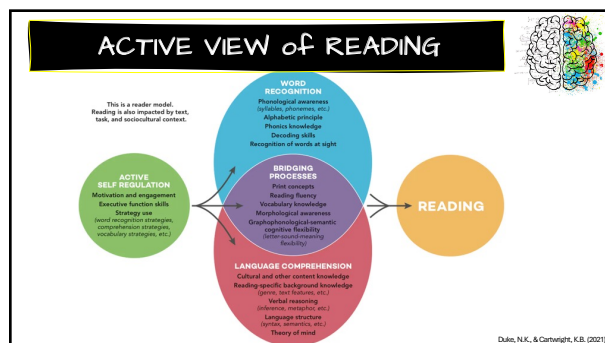
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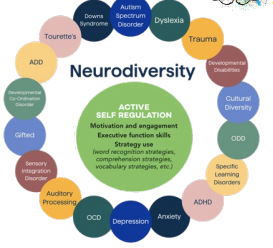
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MOTIVATION INTERVENTIONS

Every child deserves
A CHAMPION -
 AN ADULT WHO WILL
never give up on them,
WHO UNDERSTANDS
the power of connection,
 AND INSISTS THAT THEY
become the best
that they can possibly be.

- RITA PIERSO



Duke, N.K., & Cartwright, K.B. (2021)

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MOTIVATION INTERVENTIONS

I AM DETERMINED **NOT TO GIVE UP** ON MY STUDENTS.
 I WILL FIGHT FOR THEM TO HAVE THE RESOURCES THEY NEED TO BE SUCCESSFUL.
 I WILL SEE THEM AS INDIVIDUALS AND NOT AS LABELS.
 I ACKNOWLEDGE THE POTENTIAL IN EACH CHILD AND **SPARK THEIR POTENTIAL** EACH DAY, RATHER THAN LABELING KIDS BASED ON THEIR PAST CHOICES.
 EVERY DAY IS A **NEW AND FRESH START** FOR THEM AND FOR ME.
 I CHOOSE TO NOTICE AND **LET GO** OF LIMITING BELIEFS THAT DON'T SERVE ME OR MY STUDENTS' WELL.



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#2 EXECUTIVE FUNCTIONING



CORE to READING

WORKING MEMORY

This function involves holding information in mind while simultaneously working with it, such as remembering the beginning of a sentence while reading the end or holding a word's meaning while decoding the next.

COGNITIVE FLEXIBILITY

This skill allows for switching between different tasks, perspectives, or ideas, which is essential for shifting between decoding, understanding vocabulary, and comprehending the overall meaning of a text.

INHIBITORY CONTROL

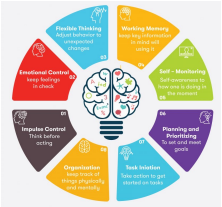
This is the ability to suppress distracting thoughts or behaviors, allowing readers to focus on the text and ignore irrelevant information.

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#2 EXECUTIVE FUNCTIONING



CORE to READING



WORKING MEMORY

This function involves holding information in mind while simultaneously working with it, such as remembering the beginning of a sentence while reading the end or holding a word's meaning while decoding the next.

Explicit & Cumulative Instruction



Graphic Organizers and Supports



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#2 EXECUTIVE FUNCTIONING



Correcting without "derailing" working memory.

Immediate corrective feedback is IMPORTANT!

Immediate feedback to students about the accuracy of their responses helps ensure high rates of success and reduces the likelihood of practicing errors.

- **Allow a little bit of wait time** to see if the student will try to self-correct the error. Attempts to self-correct are important and should be encouraged even when the student is not successful because they usually indicate that the student is monitoring meaning while reading and is looking carefully at words.
- **Use pointing cues** such as pointing to the part of the word a student has read incorrectly if a student fails to self-correct. Pointing cues focus the student's attention on the print and tend to be less distracting to comprehension than verbal cues.
- **Follow up with verbal cues.** If pointing cues do not enable the student to decode the word then it is fine to follow up with a verbal cue such as "Remember it says /ah/."
- **Model decoding the word or tell the student the word** if necessary. This should be a last resort unless the word is an unfamiliar irregular word or a regular word that is beyond the student's current decoding skills. Few words should fit these categories if students are placed in appropriate texts for reading instruction.
- **Ask the student to re-read the sentence** to establish fluency and comprehension.

Reprinted with permission. Meadows Center for Preventing Educational Risk. (2016). Targeting the 2% brief: Instructional considerations for students with dyslexia. Austin, Texas: Author.

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#2 EXECUTIVE FUNCTIONING



CORE to READING



COGNITIVE FLEXIBILITY

This skill allows for switching between different tasks, perspectives, or ideas, which is essential for shifting between decoding, understanding vocabulary, and comprehending the overall meaning of a text.

REDUCE EXTRANEUS LOAD



How many different voices?

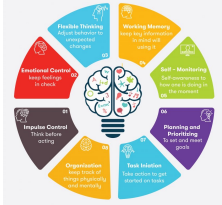


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#2 EXECUTIVE FUNCTIONING



CORE to READING



INHIBITORY CONTROL
This is the ability to suppress distracting thoughts or behaviors, allowing readers to focus on the text and ignore irrelevant information.

Time Clarity
Perky Pace



Consistent Schedule



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#3- ATTENTION



Multi-sensory instruction
is an educational approach that engages multiple senses simultaneously to enhance learning and create pathways to help students better understand and retain information.

V visual **A** auditory **K** kinesthetic **T** tactile

Engaging multiple senses: It goes beyond just listening and seeing, incorporating activities that involve touching, moving, and even smelling or tasting.

Strengthening memory and learning: By creating multiple sensory pathways to the brain, it helps students form stronger connections with the material and improve retention.

Catering to diverse learners: It acknowledges that students need varying levels of support, concrete models and stimuli.

Neurodiversity



ACTIVE SELF REGULATION
Motivation and engagement
Executive function skills
Strategy use
(word recognition strategies, comprehension strategies, vocabulary strategies, etc.)

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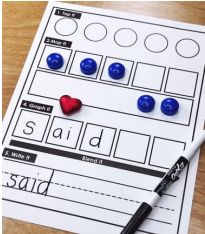
#3- ATTENTION



Multi-Sensory Instruction
is an educational approach that engages multiple senses simultaneously to enhance learning and create pathways to help students better understand and retain information.

Instructional Value Added
-not for entertainment-

V visual **A** auditory **K** kinesthetic/motor **T** tactile



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#3- ATTENTION

ORTHOGRAPHIC MAPPING

Orthographic memory involves a connection-forming process in which the oral phonemes in spoken words are "bonded" to the letters used to represent those phonemes.

We "map" words when we mentally glue the **sound, spelling, and meaning** of a word.

Auditory Visual Kinesthetic

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#4- LANGUAGE ABILITIES

Frontal Lobe: responsible for executive functions, planning, and decision-making.

Parietal Lobe: responsible for spatial awareness and processing sensory information.

Temporal Lobe: responsible for memory and language comprehension.

Occipital Lobe: responsible for visual processing.

Neurodiversity

Conditions: ADHD, Tourette's, Autism Spectrum Disorder, Dyslexia, Trauma, Specific Learning Disorder, OCD, Anxiety, Depression, Auditory Processing, Sensory Integration Disorder.

ACTIVE SELF REGULATION

Sub-points: Motivation and engagement, Executive function skills, Strategy use.

Source: NRC & Comwright, K.B. (2001)

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#4- LANGUAGE ABILITIES

The Vortex of Dyslexia

Trigger:

- reading aloud
- a timed task
- homework
- a writing assignment
- a practice assignment
- a judgmental teacher

Dyslexic Readers

- How are we supporting students with triggers?

Work harder

Are you trying?

Focus

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#4- LANGUAGE ABILITIES

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#4- LANGUAGE ABILITIES

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WHAT CAN WE DO?

Every child deserves A CHAMPION - the adult who believes in them, who gives them the power of connection, and who believes in their ability to become the best learner one possibly be.

Dr. Susan M. Engel

NO NUMBER

I can't do it!

Mathematical Concepts

Auditory Visual Kinesthetic

Checklist

Reduce Extraneous Load

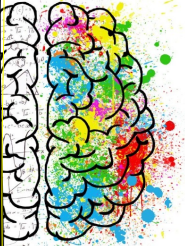
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