

FAMILY RESOURCES & THE SCIENCE OF READING

WHAT DOES NEUROSCIENCE TELL US ABOUT HOW THE BRAIN LEARNS TO READ?

In the brain of a proficient reader, neural pathways connect the areas of the “reading network” in the left hemisphere. In the brain of a developing reader, these connections are still being formed. Learning to read literally changes the brain.

Developing readers decode words, relying on the area of the brain that links the sounds and symbols of language (1). Decoding reveals a word’s pronunciation (2), which then triggers its meaning (3). The student is beginning to read, but not fluently.

Proficient readers recognize words instantly, eliminating the need for decoding. This is possible because the process of learning to read causes a specialized area to develop within the brain’s visual system—the visual word form area, named the “letterbox” by neuroscientist Stanislas Dehaene (2009). The letterbox supports orthographic mapping, the process that permanently stores words in long-term memory. When a student sees words that have been mapped to long-term memory, neurons fire in the letterbox (1), then the oral language (2) and meaning (3) areas of the brain (Dehaene 2009). The student is now reading fluently.



WHAT DOES SCIENCE-ALIGNED EDUCATIONAL RESEARCH TELL US ABOUT EFFECTIVE READING INSTRUCTION?

Word recognition skills, detailed at the bottom of the graphic, are woven together to support increasingly *automatic* reading. Language comprehension skills, shown at the top, work together so that reading can become increasingly *strategic*. These two groups of skills are woven together to make proficient reading possible. Waterford’s six instructional strands for literacy align with Scarborough’s Reading Rope.

Waterford’s Instructional Strands for Literacy



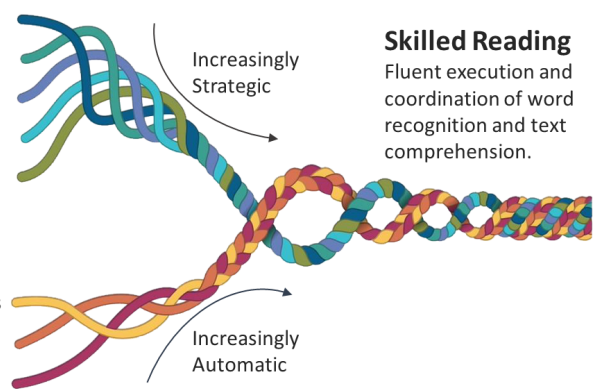
Scarborough’s Reading Rope

Language Comprehension

- Background Knowledge
- Vocabulary Knowledge
- Language Structures
- Verbal Reasoning
- Literacy Knowledge

Word Recognition

- Phonological Awareness
- Decoding (and Spelling)
- Sight Recognition



Scarborough, H. 2001. Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. Pp. 97-110 in S. B. Neuman & D. K. Dickinson (Eds.) *Handbook of Early Literacy*. NY: Guilford Press.

HOW IS THE SCIENCE OF READING INTEGRATED INTO WATERFORD'S FAMILY RESOURCES?

Waterford's resources for families are built on a foundation of research from the neuroscience and education fields. Our goal is to share knowledge of the science of reading with families in inviting and empowering ways to help them support and advocate for their children.

Resources include:

Personalized Weekly Messages sent through the **Mentor app**

PHONOLOGICAL AWARENESS

Phonemic awareness, a subset of phonological awareness, is the best predictor of students' ability to identify words quickly and accurately (Shaywitz & Shaywitz, 2020). Because oral language is experienced as a continuous stream of speech, breaking it into smaller units of sound is not intuitive—phonological awareness skills must be taught explicitly (Castles et al., 2018; Willingham, 2017; Moats, 2010).

Allyah has been counting the individual sounds in words. Play a game of Clap and Count. Help your child clap and count the sounds in animal words.

- Pig, /p/ /i/ /g/—3 sounds
- Horse, /h/ /or/ /s/—3 sounds
- Cow, /k/ /ou/—2 sounds

Try with more words!

LANGUAGE CONCEPTS

Because early oral language skills are a strong predictor of later reading outcomes (NELP, 2008), instruction that encourages conversation is effective. Vocabulary knowledge and background knowledge are closely linked, and they are both important contributing factors for reading comprehension (Snow, 2017; Adams, 1990; Scarborough, 2001). A strong understanding of grammar also supports reading comprehension (Silva & Cain, 2015).

Jamal is learning about nouns. Listen to [this song](#). Then make a chart with three columns: People, Places, Things. **Ask your child to think about what you might find on a farm.** Add each idea to the correct column. How many nouns can Jamal collect?

Supporting Resources available at mentor.waterford.org

PHONICS

Phonics should be taught explicitly and systematically. Knowledge of the 64 most common letter-sound correspondences along with the ability to identify the 100 most common words allows readers to identify 90% of words they tend to see in texts (Solity and Vousden, 2009).

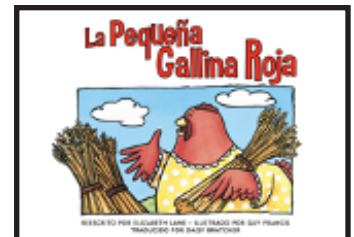
a	b	c
d	e	f
g	h	i
j	k	l

Letter Cards: Word Stems		
am	at	ap
an	ad	op
ot	in	id

Word-building practice, in which students identify the sounds in a word and then identify the letter or letters that represent each of those sounds, should be an integral part of instruction.

COMPREHENSION & VOCABULARY

Research shows that literacy skills are transferable between languages. The hundreds of book in Waterford's library are available in English, Spanish, and English with Spanish support. Comprehension and vocabulary development in any language support the development of these skills in English (Cummins, 1981).



Waterford Family Academy sessions facilitated by our Professional Services Team

FLUENCY

Students build a large bank of sight words through the process of orthographic mapping that links sounds and letters to store words in long-term memory (Ehri, 2005; Castles et al., 2018). A large sight-word bank makes fluent reading possible, and fluency frees up the cognitive load required for decoding to support comprehension.

LISTEN
SAY and COUNT
DRAW a line for each sound.

b a th

bath

COMMUNICATION

Waterford's Communication strand fosters the growth of speaking, listening, and writing skills. Serve and Return interaction plays a critical role in the development of language skills and healthy attachments for young children.

(<https://developingchild.harvard.edu/science/key-concepts/serve-and-return/>)



Cummins, J. (1981). The role of primary language development in promoting educational success for language minority students. In California State Department of Education (Ed.), *Schooling and language minority students: A theoretical framework* (pp. 3-49). Los Angeles: California State University, Evaluation, Dissemination and Assessment Center.

For other citations, see our full [bibliography here](#).

PROFESSIONAL SERVICES OFFERING

SCIENCE OF READING

The series empowers educators with the knowledge and tools to deliver instruction aligned to the science of reading. Participants receive a toolkit with research, guides, special access to blogs, and curated activities that support the science of reading instruction in the classroom. Participants learn how to:

Use the latest neuroscience to inform reading instruction

Help students build key literacy skills

Teach students to become effective communicators

Implement effective strategies that build word knowledge and listening comprehension skills

TOPIC	GOALS	OUTCOMES	MEASUREMENT
An Overview of the Science of Reading: From Research to Instruction	Gain an understanding of what neuroscience tells us about how the brain learns to read through educational research and effective reading instruction	Learn how you can put your students on the path to reading success with the science of reading	Survey at the end of the complete Science of Reading Series
Phonological Awareness: The Structure of Spoken Language	Define phonological awareness and why it is an essential part of learning to read	Help your students build phonological awareness through hands-on strategies	
Phonics: Breaking the Reading Code	Outline research-based approaches for phonics instruction	Enable students to connect sounds to letters through research-based activities	
Fluency: The Bridge from Word Identification to Reading Comprehension	Understand how students learn to read fluently and how fluent reading contributes to reading comprehension	Learn strategies to help your students develop fluency	
Comprehension & Vocabulary: Reading as a Lifelong Tool for Learning	Understand how educators can provide building blocks for lifelong reading and learning	Walk away with tools to provide the foundation for effective comprehension skills	
Language Concepts: The Structure of Written Language	Describe language concepts as they support reading proficiency	Employ strategies for a strong understanding of language concepts	
Communication: The Four Domains of Language	Identify the four domains of language—reading, writing, speaking, and listening—and explore how they are interconnected	Learn how to help your students become effective communicators by building their proficiency in each of these domains	
Conclusion: Putting it All Together & Celebration	Review and explore additional strategies that support principles of the science of reading	Earn a certificate of participation for the Science of Reading Series	

PACKAGES

ONSITE

Delivered in 2 consecutive days
Up to 20 participants
Price includes travel and digital toolkit

DAY 1

- An Overview of the Science of Reading: From Research to Instruction
- Phonological Awareness: The Structure of Spoken Language
- Phonics: Breaking the Reading Code
- Fluency: The Bridge from Word Identification to Reading Comprehension

DAY 2

- Comprehension & Vocabulary: Reading as a Lifelong Tool for Learning
- Language Concepts: The Structure of Written Language
- Communication: The Four Domains of Language
- Conclusion: Putting it All Together & Celebration

VIRTUAL

Delivered over 8 sessions
Each virtual session is up to 2 hours
Up to 20 participants
Price includes recordings and digital toolkit

Session 1: An Overview of the Science of Reading: From Research to Instruction

Session 2: Phonological Awareness: The Structure of Spoken Language

Session 3: Phonics: Breaking the Reading Code

Session 4: Fluency: The Bridge from Word Identification to Reading Comprehension

Session 5: Comprehension & Vocabulary: Reading as a Lifelong Tool for Learning

Session 6: Language Concepts: The Structure of Written Language

Session 7: Communication: The Four Domains of Language

Session 8: Conclusion: Putting it All Together & Celebration

¡Una increíble oportunidad de aprendizaje hecho en casa!

Waterford Upstart es un programa de aprendizaje hecho en línea **GRATUITO** para los niños que estarán entrando al **Kínder en el 2022 o 2023**. Ellos aprenderán las habilidades que necesitan en lectura, matemáticas y ciencias en tan solo minutos al día. Además, debido a que ya ha sido pagado por el estado, ¡no tiene costo para usted!

¡Esté confiado en que su hijo estará **preparado para la escuela** con Waterford Upstart!



¡El **97%**

de los padres recomendarían **Waterford Upstart!**

¿Qué obtiene usted?



Un **software galardonado** que su hijo usa en casa menos de **30 minutos al día**



Actividades **independientes** en línea y **recursos** para prácticas fuera de línea



Guía y herramientas para ayudar a apoyar el aprendizaje de su hijo

¿Por qué debe inscribirse?



¡Waterford Upstart funciona!

En promedio, los graduados entran al Kínder leyendo a casi al nivel de primer año



¡Su hijo aprenderá!

El programa desarrolla las habilidades y rutinas académicas para que su hijo esté listo para sentir confianza en sí mismo y ser exitoso en la escuela



¡A usted no le cuesta nada!

Gracias al apoyo generoso de nuestros socios, nosotros le proveemos todo lo que necesita para completar el programa

*Computadora e Internet se les proporciona a las familias elegibles



Empiece hoy mismo:

Visite waterford.org/upstart

Escanee el código QR

888-982-9898

Amazing At-Home Learning Opportunity!

Waterford Upstart is a **FREE** online learning program for children entering kindergarten in 2022 or 2023. They'll learn the skills they need in reading, math, and science in minutes a day. Plus, because it's paid for by the state, there's no cost to you!

Be confident that your child is **ready for school** with Waterford Upstart!



97%

of parents would recommend **Waterford Upstart!**

What Do You Get?



Award-winning software your child uses at home less than **30 minutes each day**



Independent online activities and **resources** for off-line practice



Family-focused guidance and tools to help you support your child's learning

Why Should You Sign Up?



Waterford Upstart works!

On average, graduates enter kindergarten reading at almost a first-grade level



Your child will learn!

The program builds academic skills and routines so your child is ready to be confident and successful at school



It costs you nothing!

Thanks to generous support from our partners, we provide everything you need to complete the program
*Computer and Internet provided to qualifying families



Get started today!

Visit waterford.org/upstart

Or scan this QR code

888-982-9898