# Boost Reading

Grades K–5

Program Guide

# Our mission

Dear teachers,

You do a job that is nearly impossible and utterly essential.
We are in your corner—extending your reach, saving you time,
and enhancing your understanding of each student.

Thank you for working with us to craft rigorous and riveting
learning experiences for your classroom. We share your goal of
inspiring all students to think deeply, creatively, and for themselves.

Sincerely,
Amplify

# Table of contents

## Boost Reading Instruction

# A K–5 reading program that grows with your students

**For teachers,** Boost Reading is a research-based, standards-aligned program that supports them in building their students' reading skills across key domains—underlying language skills, decoding, fluency, comprehension, and close reading—along an adaptive pathway that includes increasingly complex skills, content, and text.

**For students,** it's a journey into a captivating game world in which they embark on a series of quests that help them become more confident readers.

Amplify worked with a team of artists, engineers, game designers, researchers, and teachers to build a socially and emotionally compelling program that's grounded in the latest research and adapts to your students' needs, no matter the learning environment.

# What makes Boost Reading different?

Summer school

Small-group instruction

Choice time or computer

At home

After-school program

Boost Reading uses captivating storylines to engage students in powerful individualized reading instruction and practice. Whether students are learning to read fluently or sharpening close reading skills, Boost Reading accelerates their growth while freeing you up to work with small groups or individual students.

## Built on the Science of Reading

Boost Reading is informed by the latest research in the science of reading. In addition to providing explicit, systematic foundational skills, it's the only program that focuses on the things we do while we're reading that allow us to make sense of text—also known as *comprehension processes.*

## Personalized literacy journey

Adapting to each reader's unique needs across 13 skill areas, students embark on W personalized journeys that offer both remediation and enrichment through a comprehensive range of instruction—from foundational skills to comprehension to close reading.

## Authentic motivation

Boost Reading was developed with game designers, educators, students, and literacy researchers to create immersive narratives and captivating instruction.

## Proven growth

Boost Reading works. Efficacy studies show significant growth for students using Boost Reading. In as little as 30 minutes a week, Boost Reading accelerates growth for all students and helps English learners close the gap with their peers.

## Continual formative data

Boost Reading gives you actionable insights into students' skills to help you differentiate instruction, monitor the growth of your whole class, and provide targeted support without more testing.

# The academic advisory team

## Bruce McCandliss
Stanford University

Bruce is one of very few neuroscientists who is also an expert on reading development. In 2006, he won the Presidential Early Career Award for Scientists and Engineers. Bruce has advised on almost every aspect of Boost Reading and was instrumental in developing the concept of *comprehension process* .

## Jane Oakhill
University of Sussex

Jane is a psychologist specializing in reading comprehension. She led much of the early research on individual differences in children's reading comprehension skills. She is the author of numerous books, most recently *Understanding and Teaching Reading Comprehension*. Jane advised on comprehension, comprehension process, and vocabulary.

## Art Graesser
University of Memphis

Art is an interdisciplinary researcher who investigates language, discourse, and communication. He developed digital technologies, such as *AutoTutor* and *Coh-Metrix,* that integrate advances in psychology, education, computational linguistics, and artificial intelligence. His primary contribution to Boost Reading is on inferences and deeper levels of discourse comprehension.

## Kelly Cartwright

Christopher Newport University

Kelly is a professor of psychology, neuroscience, and teacher preparation and the author of *Word Callers: Small-Group and One-to-One Interventions for Children Who "Read" but Don't Comprehend*. Kelly advised on cognitive flexibility in elementary school children—a critical executive function—as well as inference and comprehension.

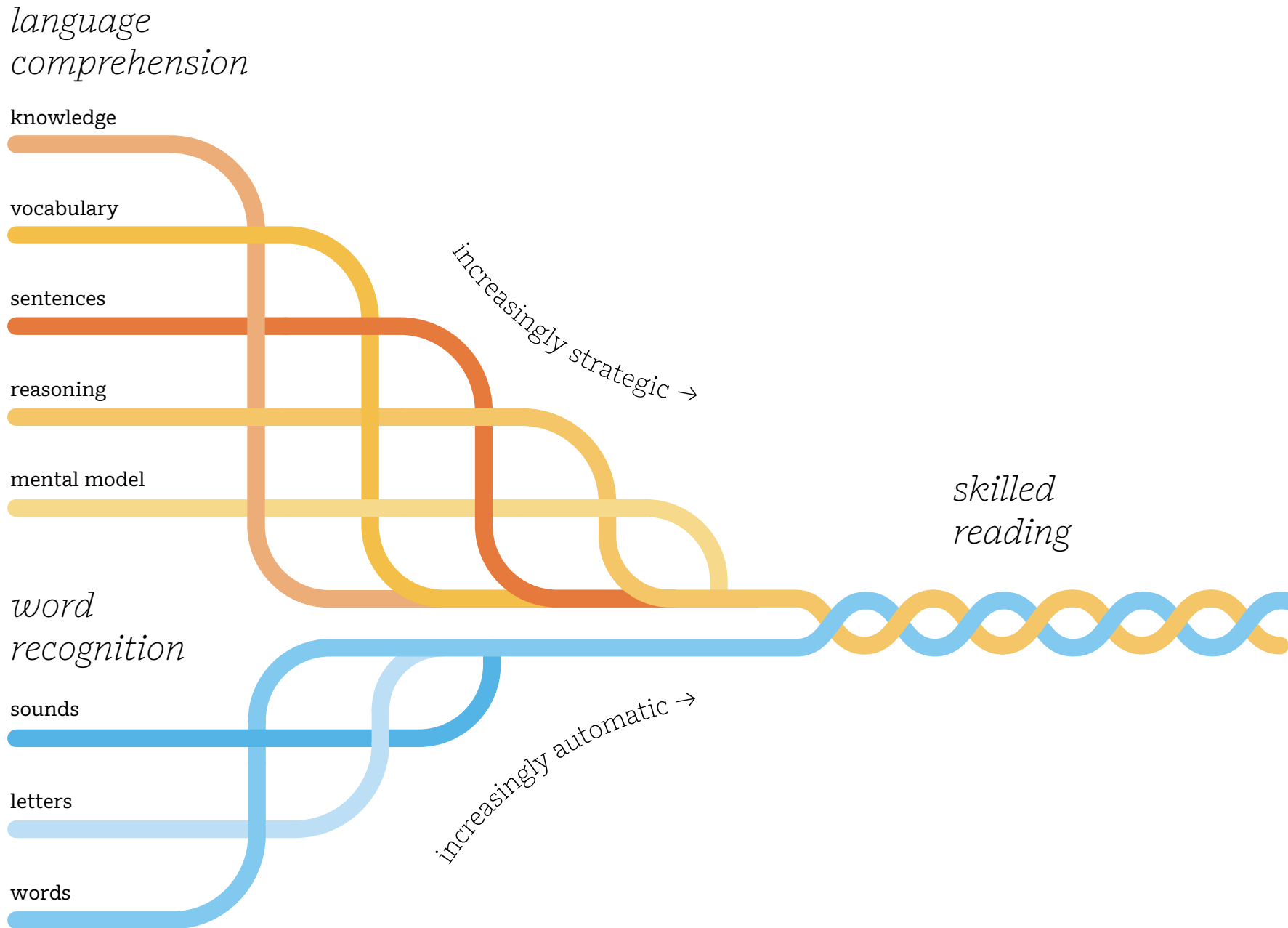## Heidi Anne E. Mesmer

Virginia Tech

A former teacher, Heidi Anne has studied beginning reading materials and text difficulty her entire career. She is an expert on matching readers to texts and the author of *Teaching Skills for Complex Text: Deepening Close Reading in the Classroom*. Heidi Anne advised on several topics, including early decoding and comprehension.

# Scope and sequence based on the Science of Reading

The Science of Reading indicates that students need explicit and systematic instruction across the key areas of literacy. This means ensuring that even the youngest students receive instruction in phonics alongside vocabulary and comprehension, and that all students practice applying these skills to real texts. In Boost Reading, these key areas are broken down into 13 skill areas. From initial placement into the program to its effortless differentiation along the way, students receive the most adaptive pathway through this robust scope and sequence and teachers get the insights they need at every turn.

In 4th and 5th grade, Boost Reading ensures that students receive the literacy skills practice they need—be it on earlier skills or grade-level content—alongside exposure and practice with grade-level vocabulary words, close reading activities and texts in the eReaders. These on-grade level activities include scaffolds like read alouds, reveal words and adaptive instructional feedback to ensure struggling readers have the support they need to work with on-grade level texts.

*language comprehension*

knowledge

vocabulary

sentences

reasoning

mental model

*increasingly strategic →*

*skilled reading*

*word recognition*

sounds

letters

words

*increasingly automatic →*

Braid diagram based on Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for Research in Early Literacy* (pp. 97–110). New York: Guilford Press.
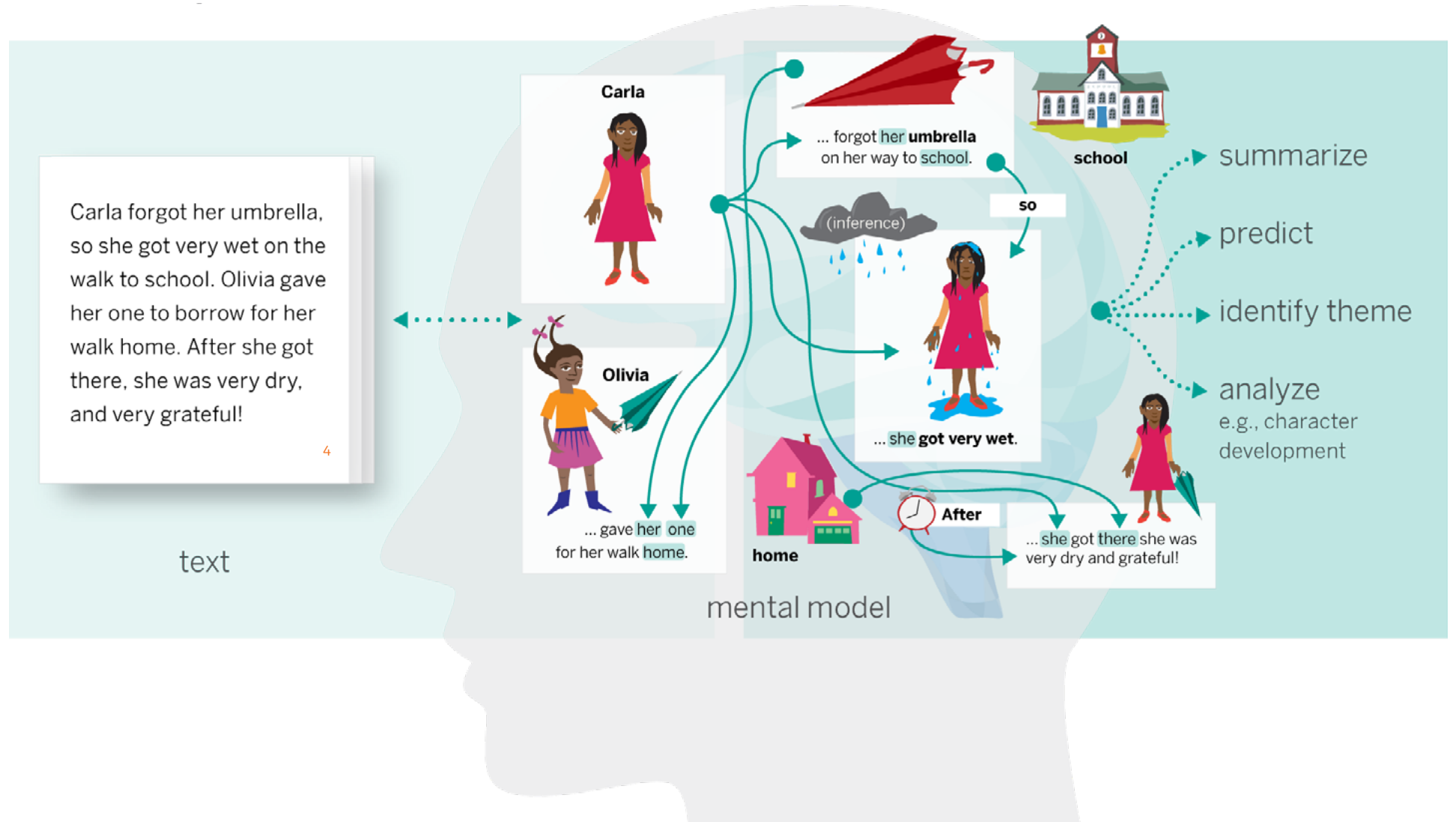
# Comprehension processes: Building mental models

Boost Reading worked with an academic advisory team to develop a program that not only builds on proven strategies for teaching reading, but also emphasizes a new model for comprehension instruction based on the latest science of how students learn to comprehend. We call this approach comprehension processes.

If you read this passage and try to recall it without looking, you likely won't remember the precise words...but you will remember its ideas. That's because you built what researchers call a mental model. Weak comprehenders lack these model-building skills. No amount of practice answering test questions (the product of good comprehension[1]) will make up for that. Through games like *Unmask That, Storyboard, Message in a Bottle* and more, Boost Reading explicitly teaches the skill of mental model-building by focusing on comprehension processes, or the underlying language and literacy abilities required to create coherent mental models. [2, 3]

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1. Rapp, D. N., van den Broek, P., McMaster, K. L., Kendeou, P, & Espin, C. A. (2007). Higher-order comprehension processes in struggling readers: A perspective for research and intervention. *Scientific Studies of Reading, 11*(4), 289–312.
2. Cartwright, K. B. (2010). *Word Callers: Small-Group and One-to-One Interventions for Children Who "Read" but Don't Comprehend.* Portsmouth, NH: Heinemann.
3. Oakhill, J., Cain, K., & Elbro, C. (2015). *Understanding and teaching reading comprehension: A handbook.* New York: Routledge.
4. Rowling, J. K. (1999). *Harry Potter and the Sorcerer's Stone.* New York: Scholastic.

comprehension processes

comprehension products



Carla

Carla forgot her umbrella, so she got very wet on the walk to school. Olivia gave her one to borrow for her walk home. After she got there, she was very dry, and very grateful!

4

text

... forgot her umbrella on her way to school.

so

(inference)

school

... she got very wet.

Olivia

... gave her one for her walk home.

home

After

... she got there she was very dry and grateful!

mental model

summarize

predict

identify theme

analyze
e.g., character development

# Unparalleled personalization

One of the challenges of managing a classroom is the need for a single teacher to make sure every student always gets the right level of attention and practice in the right areas at all times, all in limited class time. The program also provides adaptive support, meaning that the degree of scaffolding, instruction, and practice adapts within our content based on student performance.
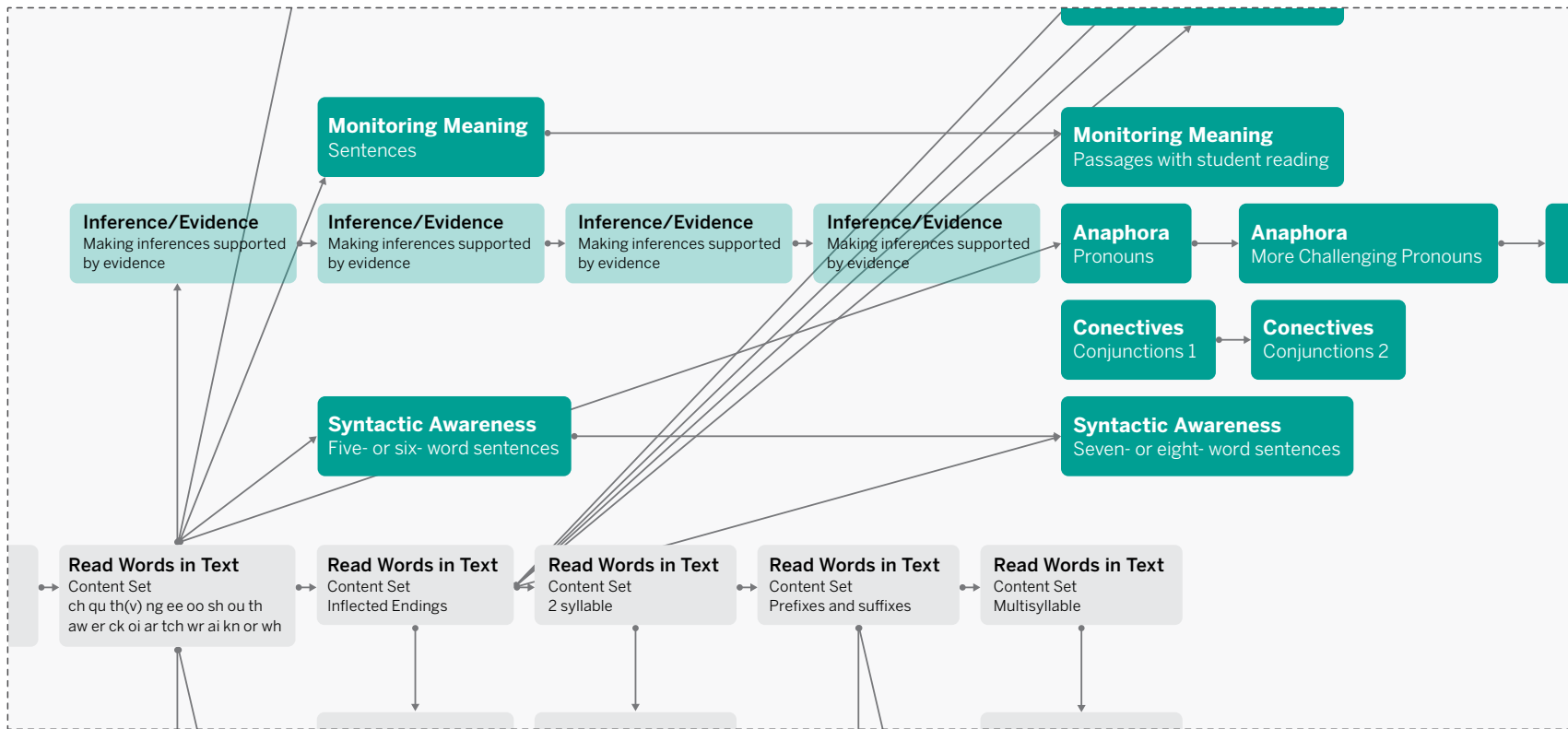
After data-based placement, students move through the program along their own learning pathway, where they encounter personalized content tailored to their evolving needs.

Moreover, Boost Reading ensures that students master difficult content in the program, rather than relying on teachers to intervene. We give teachers the insights they need to inform instruction along with the confidence to know students are receiving personalized independent instruction.

> " Boost Reading has been a great way for me to add differentiation in my classroom. My students love working on it, and they often share about topics that they have learned before it is introduced to the class. I also love that I can monitor how they are doing and adjust small-group instruction to help them. "

—1st grade teacher, Utah

**Monitoring Meaning**
Sentences

**Monitoring Meaning**
Passages with student reading

**Inference/Evidence**
Making inferences supported by evidence

**Inference/Evidence**
Making inferences supported by evidence

**Inference/Evidence**
Making inferences supported by evidence

**Inference/Evidence**
Making inferences supported by evidence

**Anaphora**
Pronouns

**Anaphora**
More Challenging Pronouns

**Conectives**
Conjunctions 1

**Conectives**
Conjunctions 2

**Syntactic Awareness**
Five- or six- word sentences

**Syntactic Awareness**
Seven- or eight- word sentences

**Read Words in Text**
Content Set
ch qu th(v) ng ee oo sh ou th
aw er ck oi ar tch wr ai kn or wh

**Read Words in Text**
Content Set
Inflected Endings

**Read Words in Text**
Content Set
2 syllable

**Read Words in Text**
Content Set
Prefixes and suffixes

**Read Words in Text**
Content Set
Multisyllable

Pinpoint adaptivity provides simultaneous remediation and advancement

15

# Engagement engineering

**As an educator,** you know it's not just about learning to read, but loving to read. While students are developing their language and decoding skills, they're also joining a community of readers passionate about books. With that in mind, we built Boost Reading with the same depth of research on the science of engagement and motivation as on the science of reading. The end result is a program that provides a coherent learning narrative, fosters a growth mindset, and meaningfully delivers clear and consistent feedback to keep students engaged in their own learning.

A coherent learning narrative: Using the science behind engagement and motivation, we built Boost Reading to deliver compelling narrative experiences that speak to students' stories of growth and development. This allows them to directly map their progress in the storyline to their reading effort and growth, helping them understand the value of effort and practice.1

As students progress through these developmental stages, Boost Reading's story-driven worlds evolve along with them. Our team of experts created storylines that appeal to specific age bands—whether your student is a curious, imaginative first grader or an adventure-ready multitasking fifth grader, Boost Reading has content to appeal directly to them.

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1. Sawyer, R., Smith, A., Rowe, J., Azevado, R., & Lester, J. (2017). *Is more agency better? The impact of student agency on Game-Based Learning.* The IntelliMedia Group. Retrieved from: https://www.intellimedia.ncsu.edu/wp-content/uploads/Sawyer-AIED-2017.pdf.
2. Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum.
3. Dweck, C. (2006). *Mindset: The new psychology of success.* New York: Random House LLC.

**Grades K–1: Reading is magical.**

Just beginning their learning-to-read journey, our youngest students are intensely curious and have active imaginations. In the Boost Reading game world, students befriend a curious companion—a Curioso—who grows alongside them and welcomes them into Bookerton, a community of readers.



**Grades 2–3: Reading has the power to reveal.**

These students love order and facts, appreciate surprise, and revel in silliness. The story continues for them when a stranger comes to Bookerton and uncovers a forgotten secret from the past, pulling students into mystery.



**Grades 4–5: Reading can transport you to other worlds and perspectives.**

As they mature, kids like to be experts, and thus appreciate rules and logic. These students unlock an abandoned workshop in the game, and discover that their world is just one of many to explore and comprehend.

**Fostering a growth mindset:** "Keep going, you're growing!" This is an example of how the watch words in Boost Reading celebrate and foster a growth mindset.[2] The language within our feedback loops is designed to reward persistence as much as performance. Even when a student is struggling, their continued effort at skill practice contributes to the growth of their Curioso companion.

**Clear and consistent feedback:** Boost Reading supports positive participation loops throughout the learning activities by giving students immediate feedback as well as a clear understanding of their performance results. These results are presented within the context of the game world to motivate students to keep trying.[3]
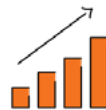
# Driving impact for all students

The need for effective, research-based instruction is more critical than ever. In a recent study that compared more then 32,000 students who used Boost Reading with a matched comparison group of over 97,000 students who did not, Boost Reading was proven to increase the percentage of students who moved from at-risk to benchmark or above in all grades.
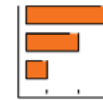
## Scores improve with just 30 minutes per week

With just 30 minutes of use per week, Boost Reading students grew significantly more in every DIBELS® 8th Edition measure across all grade levels.

## Moving the needle for at-risk students

Students using Boost Reading who started the year well below or below benchmark were 36% more likely to finish the year on track than students who did not use Boost Reading.
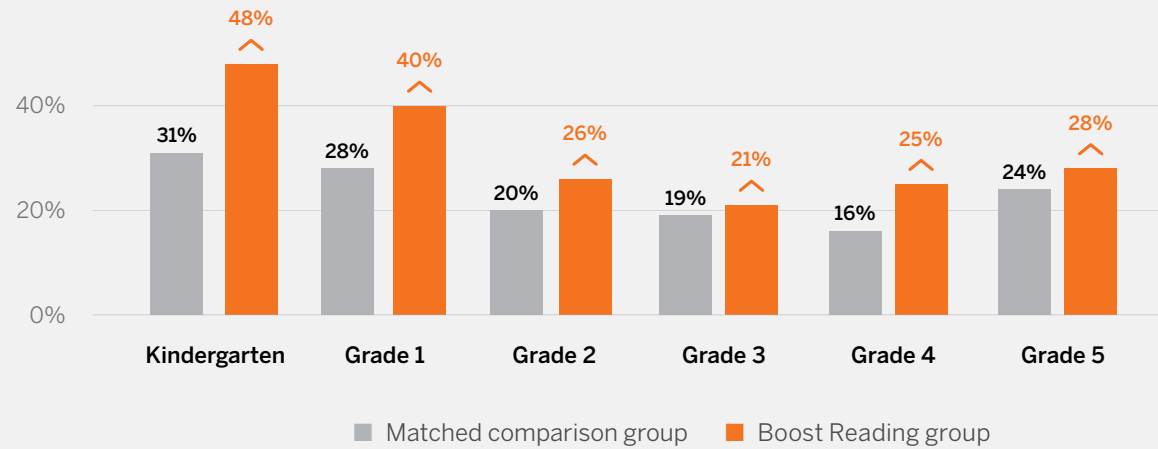
## Closing the gap for ELLs

English language learners who started the year below benchmark were 43% more likely to finish the year on track compared to those who did not use Boost Reading.

## Meets ESSA Moderate Tier

Boost Reading meets ESSA's Moderate Evidence criteria through a matched study showing significant and positive effects on student outcomes.
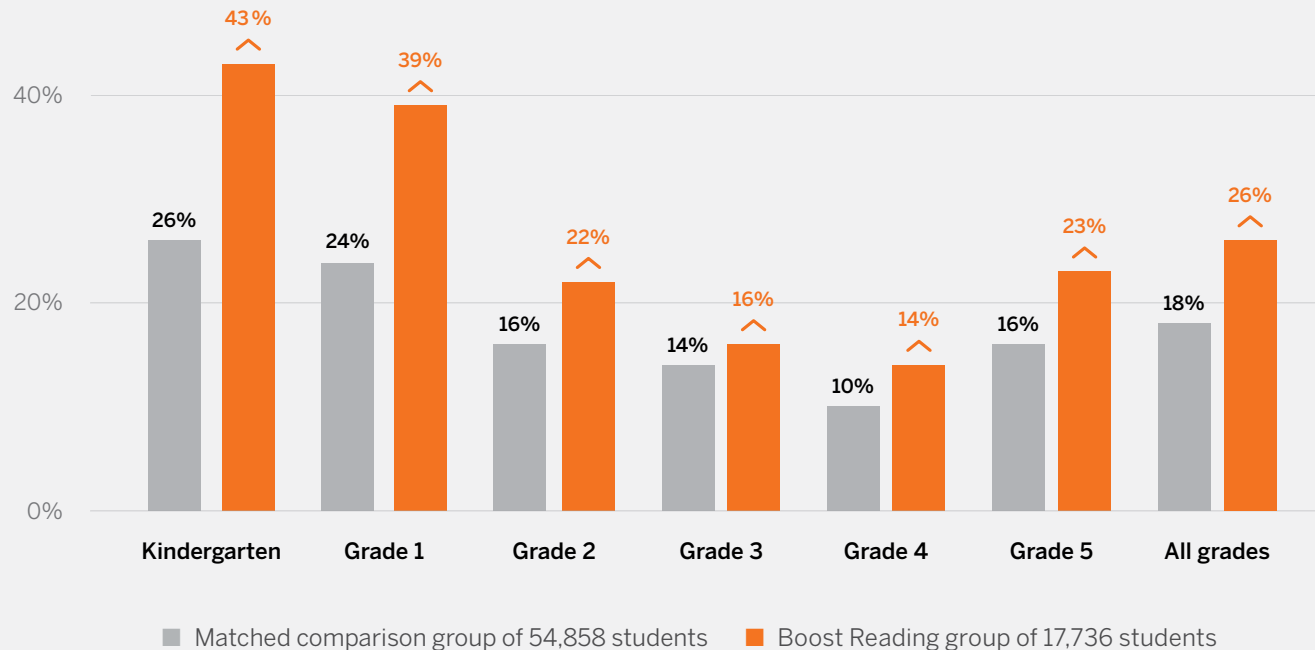
**At-risk students who moved from below benchmark to meeting or exceeding benchmark during the 2020–21 school year**



Matched comparison group  ■ Boost Reading group

**Insight 1:**

In kindergarten, 48% of at-risk students in the Boost Reading group ended the year at benchmark or above, compared to 31% of the comparison group.

**At-risk English language learners who moved from below benchmark to meeting or exceeding benchmark during the 2020–21 school year**



Matched comparison group of 54,858 students  ■ Boost Reading group of 17,736 students

**Insight 2:**

In kindergarten, 43% of at-risk English language learners in the Boost Reading group ended the year at benchmark or above, compared to 26% of the comparison group.

# Diagnostic data, without wasting time on assessment

**When your students** submit a response in Boost Reading, every single tap and click they make is securely collected by the program—it even records the amount of time they spend on any given page or activity! This gives you access to an almost unparalleled amount of data on each student, far more than any assessment can provide.

The Boost Reading dashboard uses all of this information to provide you with insights into student progress across 11 dimensions of reading growth. It updates continuously, too—which means you can use it to identify students in need of support even while they are playing.

The program's caregiver report also enables you to easily share student literacy growth information with caregivers, making Boost Reading ideal for remote and hybrid learning.

We designed the dashboard to be the fastest place for a teacher to answer these three key questions:

**1** What are my students working on right now, so I can plan my core class instruction accordingly?

**2** Who is struggling and what do they need help with?

**3** Who is not spending enough time in the program to make progress?

Boost Reading

YOUR DASHBOARD　　TEACHER GUIDE　　RESOURCE LIBRARY　　DEMO　　　　mCLASS HOME　　ANGELA MARTINEZ

🏫 Bridge Park ▾　　👥 Martinez 1 ▾　　　　　　　　　🖶 PRINT

Insights　　Students　　Class Settings

## Usage ⓘ
**1**

🗓 Last Week ▾

**63%**

**10**
students out of 16
meeting usage target

These students are not reaching their recommended
weekly usage target.
**3**

| 👤 Abel, Tyrell | 10 m |
| 🕐 Ahrens, Manuel | 22 m |
| 🕐 Dedrick, Otylia | 25 m |

## Subskill Mastery ⓘ

**15%**

Subskills completed
year to date

**Phonological Awareness** 👤 1 student
Segment (count) syllables
1-3 syllable words 1: e.g., spill, jacket, hibernate

**Early Decoding** 👤 2 students
Decode VC, CVC Words/Decode Words with Blends
matodcgins

**Advanced Decoding** 👤 2 students
Decode VC, CVC Words/Decode Words with Blends
matodcgins

Most recent subskills mastered over the last seven days.
1/7–1/14

## Trouble Spots ⓘ
**2**

| **Ahrens, Manuel**<br>Typical Growth | **Phonological Awareness**<br>Segment (count) syllables<br>1-3 syllable words 1: e.g., spill, jacket,<br>hibernate | • • • |
| **Akiyama, Shrinivas**<br>Typical Growth | **Early Decoding**<br>Decode VC, CVC Words/Decode Words with Blends<br>matodcgins | • • • |
| **Abel, Tyrell**<br>Typical Growth | **Early Decoding**　　　　✓<br>Read irregularly spelled words<br>Grade 1 irregular words 1: e.g., today, should,<br>some | • • • |

## Literacy Growth: Comprehension ⓘ

100%

Above 19%

STUDENTS IN EACH GROWTH TRAJECTORY

Typical 40%

Below 6%

0%

Not Available
20 students

**Typical Growth**

**7 Students**　　　　　　**February Status**

| Flores, Kimberly | Not started |
| Stuart, John | Invalidated |
| Dedrick, Otylia | Invalidated |
| Abel, Tyrell | Completed |
| Akiyama, Shrinivas | Completed |
| Ahrens, Manuel | Completed |
| Taylor, James | Completed |

# Beginning with rhyme

Research shows that phonological awareness (how we hear and manipulate sounds within words) develops from large to small— from rime (like "at" in bat and cat and hat) to phoneme. Yet despite rhyming awareness being a strong predictor for reading and spelling success, [1, 2] most students enter kindergarten without solid rhyming skills.[3]

Given the importance of both rime and rhyme, we designed games like Zoom Boom to build and strengthen these skills and get students off to a strong start.

"The developing reading system operates at multiple levels of grain size. This is why onset-rime awareness continues to predict reading development in English and why a model of reading acquisition based on small units only cannot adequately capture the processes involved in learning to read a nontransparent orthography.[4] "
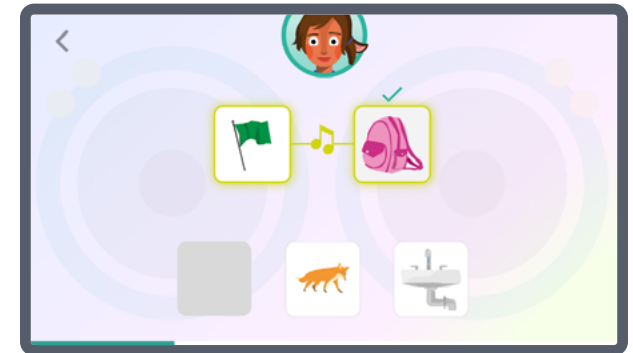
**Usha Goswami**
University of Cambridge

RF.K.2.A

1. Bryant, P. E., Bradley, L., Maclean, M., & Crossland, J. (1989). Nursery rhymes, phonological skills and reading. *Journal of Child Language, 16,* 407–428
2. Goswami, U. (2017). Early phonological development and the acquisition of literacy. In S.B. Neuman and D. K. Dickinson (Eds.) *Handbook of Early Literacy Research, Volume 1.* (pp. 111–125). New York, NY: Guilford Publications.
3. Paulson, L. H. (2004). The development of phonological awareness skills in preschool children: From syllables to phonemes. *Graduate Student Theses, Dissertations, & Professional Papers.*
4. Goswami, U. (2002). In the beginning was the rhyme? A reflection on Hulme, Hatcher, Nation, Brown, Adams, and Stuart (2002). *Journal of Experimental Child Psychology, 82*(1), 47–57.

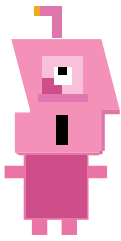*Zoom Boom* opens with instructions in hip-hop. form.



Students practice recognizing rhyming words by choosing the picture of a word that rhymes with the prompt.



Hearing multiple words with the same rime (ending sounds) has been hypothesized to help students recognize rime spellings when they begin to read.

" I really liked the rhyming game [*Zoom Boom*] but I don't really play it too much because there are so many other fun games! "

—Kindergarten student, New York

# Words are made of sounds. (I)

**Children read** by translating letters into sounds, then putting those sounds together into words. That's why it's so important for them to hear the sounds within words—like /c/, /a/, /t/ in "cat"— even before they recognize the letters.[1] This phonological awareness is a strong predictor for their future success in reading,[2] especially when practiced with phonics.[3, 4]

We designed the game Gem & Nye to offer comprehensive practice that involves both listening to and blending parts of compound words, syllables, onset-rimes, and phonemes, to help students become more aware of the sounds in words.

" One of the strongest findings from decades of literacy research is that beginning readers need practice in hearing the individual sounds that make up words—phonological awareness. Cute robots can help!"

**Heidi Anne E. Mesmer**
Virginia Tech

RF.K.2.B
RF.1.2.B
RF.K.2.C

1. Smith S. B., Simmons, D. C., & Kame'enui, E. J. (1998). Phonological awareness: Instructional and curricular basics and implications. In D. C. Simmons & E. J. Kame'enui (Eds.), *What reading research tells us about children with diverse learning needs: Bases and basics.* Mahwah, NJ: Lawrence Erlbaum Associates.
2. National Institute of Child Health and Human Development (NICHD).) (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of scientific research literature on reading and its implications for reading instruction. Report of the subgroups.* (NIH Publication No. 00-4754). Washington DC: US. Government Printing Office.
3. Torgesen, J. K.,. Wagner, R. K., & Rashotte, C. A. (1999). Longitudinal studies of phonological processing and reading. *Journal of Learning Disabilities, 27*(5), 276–286.
4. Troia, G.A. (1999). Phonological awareness intervention research: A critical review of the experimental methodology. *Reading Research Quarterly, 34*, 28–52.
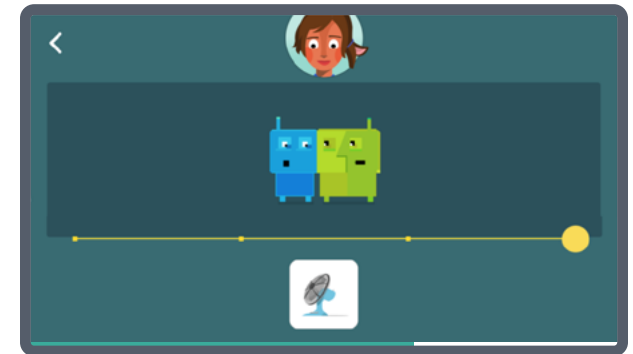
Gem can say only the beginnings of words: /f/; Nye only the endings: /an/. Which word are they saying?



The game progresses from compound words to syllables, onset-rimes, and phonemes—up to five phonemes in a word.



Students who need extra support can use a slider to control the speed at which the parts blend into a word, building their ear for the sounds within words.

" My students begged to get on Amplify and they cried when it was time to log off! This program is a great addition to our curriculum. "

—2nd-grade teacher, Utah

# Words are made of sounds. (II)

**Early learners** develop their phonological awareness by first learning to manipulate compound words, before moving on to smaller grain sizes—blending syllables, onset-rimes, and finally phonemes.[1, 2]

Since students find segmenting words (fan to /f/ /a/ /n/) more challenging than blending (/f/ /a/ /n/ to fan),[3] our program builds their phonological awareness through counting, often using representations like updated versions of Elkonin Boxes to help students visualize the sounds.[4]

" Beginning readers need a great deal of practice manipulating the sounds in words. Adaptive gaming approaches can provide many more 'at-bats' than would be possible for a single teacher working with a whole class, helping to build the neural pathways essential to the acquisition of reading."

**Bruce McCandliss**
Lead Consultant
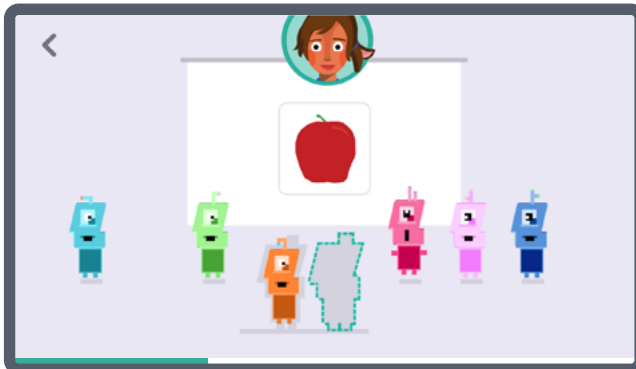
RF.K.2.B
RF.K.2.C     RF.K.2.D
RF.1.2.C     RF.1.2.D

1. Smith S. B., Simmons, D. C., & Kame'enui, E. J. (1998). Phonological awareness: Instructional and curricular basics and implications. In D. C. Simmons & E. J. Kame'enui (Eds.), *What reading research tells us about children with diverse learning needs: Bases and basics.* Mahwah, NJ: Lawrence Erlbaum Associates.
2. Torgesen, J. K.,. Wagner, R. K., & Rashotte, C. A. (1999). Longitudinal studies of phonological processing and reading. *Journal of Learning Disabilities, 27*(5), 276–286.
3. National Institute of Child Health and Human Development (NICHD).) (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of scientific research literature on reading and its implications for reading instruction. Report of the subgroups.* (NIH Publication No. 00-4754). Washington DC: US. Government Printing Office.
4. Troia, G.A. (1999). Phonological awareness intervention research: A critical review of the experimental methodology. *Reading Research Quarterly, 34*, 28–52.
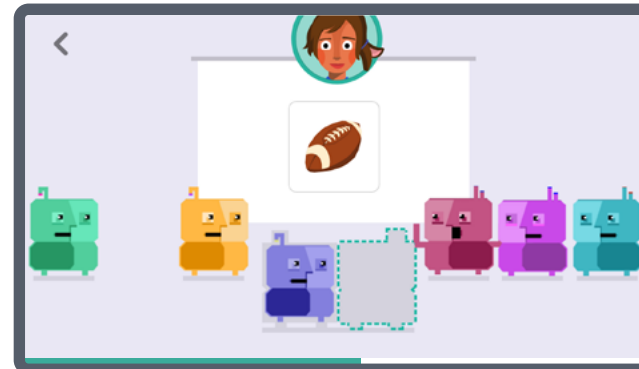
In *All Aboard,* students learn to segment and count sounds in words—syllables. then phonemes. They drive a train the same number of track segments as there are sounds in the word in order to get the train home.



In *Cut It Out,* students isolate individual phonemes by listening to a beginning, middle, or ending sound and choosing a picture of the word that contains the sound in the corresponding position.



In *Wordbots,* the bots can speak only part of a word. Students practice segmenting by finding the right combination of bots to make a target word.



*Wordbots* start by only saying the parts of a compound word before progressing to syllables and then onsets (beginning sounds) and rimes (ending sounds).

# Effortless differentiation

It's well established that students vary in the amount of phonics instruction and practice they need to become fluent decoders,[1] but it's hard for teachers to give just the right level of differentiation to each student every day. This is an area where a carefully designed digital phonics program can directly accelerate learning.[2] Boost Reading's suite of instructional games algorithmically adapts its level and pace to meet each student where they are. Students can get more at-bats in 15 minutes than they might in a week of classroom instruction.

" Students who are struggling readers need more intensive instruction than students who are not.[1] They need more time and repetition to reach the level of automaticity that facilitates fluent reading for meaning.[3, 4] "

**Bruce McCandliss**
Lead Consultant

RF.K.3.A    RF.K.3.B
RF.1.3.A    RF.2.3.B

1. Torgesen, J. (2002). The prevention of reading difficulties. *Journal of School Psychology, 40*(1), 7–26.
2. Brem, S., Bach, S., Kucian, K., Kujala, J. V., Guttorm, T. K., Martin, E., ... & Richardson, U. (2010). Brain sensitivity to print emerges when children learn letter–speech sound correspondences. *Proceedings of the National Academy of Sciences, 107*(17), 7939–7944.
3. Hudson, R. F., Pullen, P. C., Lane, H. B., & Torgesen, J. K., (2009). The complex nature of reading fluency: A multidimensional view. *Reading & Writing Quarterly, 25*(1), 4–32.
4. Ritchey, K. D., & Speece, D. L. (2006). From letter names to word reading: The nascent role of sublexical fluency. *Contemporary Educational Psychology, 31,* 301–327.
5. Carnine, D., Silbert, J., Kame-enui, E. J., Tarver, S. G., & Jungjohann, K. (2006). *Teaching struggling and at-risk readers: A direct instruction approach.* Upper Saddle River, NJ: Pearson.

The characters in *Hangry Goblins* become "hangrier" if you don't feed them correctly and quickly.



The game gets harder as it progresses.



Multiple goblins appear with more challenging demands, including consonant digraphs, blends, and vowel teams. Students move from accurate-and-slow toward fluency. [3–5]

" Boost Reading has been a great way for me to add differentiation in my classroom. My students love working on it, and they often share about topics that they have learned before it is introduced to the class. I also love that I can monitor how they are doing and adjust small group instruction to help them."

—1st-grade teacher, Utah

# Giving phonics a boost

Boost Reading takes an enhanced approach to phonics. Picky Goblins, for example, uses both multisensory (observing the positions of the lips, teeth, and tongue for each sound) and mnemonic (associating sounds, object names, and letter shapes together) approaches to help beginning readers map letter shapes to their sounds.[1–5] The program also teaches rime family spelling patterns, which help at-risk learners.[6,7] Where phonics teaches the individual sound of each letter (despite letters sometimes taking on multiple sounds[8–10]), instruction through rime patterns provides a predictable way for students to become familiar with common vowel-consonant sounds. So, if you know d-ay, you can easily analogize to s-ay, w-ay and a dozen other words [11] since -ay always makes the same sound, though *a* and *y* do not.
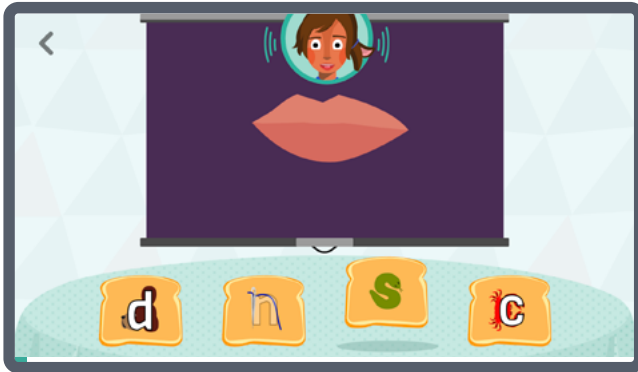
> "Direct tuition at the level of the rime helps make the phonological structure already represented in the mental lexicon explicit, facilitates the use of analogies in reading, and reflects an important level of consistency in the spelling system of English."

**Usha Goswami**
University of Cambridge

RF.K.3.A    RF.K.2.E    RF.K.3.B
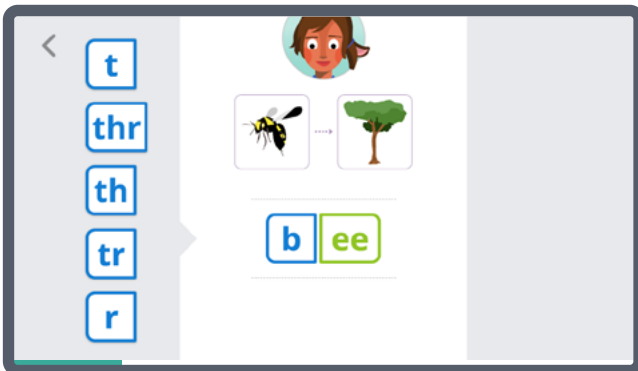RF.K.3.B    RF.K.3.A    RF.1.3 B    RF.K.3.D

1.  Ehri, L. C. (2014). Orthographic mapping in the acquisition of sight word reading, spelling memory, and vocabulary learning. *Scientific Studies of Reading*, 18(1), 5–21.
2.  Boyer, N., & Ehri, L. (2011). Contribution of phonemic segmentation instruction with letters and articulation pictures to word reading and spelling in beginners. *Scientific Studies of Reading*, 15, 440–470.
3.  Castiglioni-Spalten, M., & Ehri, L. (2003). Phonemic awareness instruction: Contribution of articulatory segmentation to novice beginners' reading and spelling. *Scientific Studies of Reading*, 7, 25–52.
4.  Ehri, L., Deffner, N., & Wilce, L. (1984). Pictorial mnemonics for phonics. *Journal of Educational Psychology*, 76, 880–893.
5.  Shmidman, A., & Ehri, L. (2010). Embedded picture mnemonics to learn letters. *Scientific Studies of Reading*, 14, 159–182.
6.  Kyle, F., Kujala, J., Richardson, U., Lyytinen, H., & Goswami, U. (2013). Assessing the effectiveness of two theoretically motivated computer-assisted reading interventions in the United Kingdom: GG Rime and GG Phoneme. *Reading Research Quarterly*, 48(1), 61–76.
7.  Hatcher, P., Hulme, C., & Snowling, M. (2004). Explicit phoneme training combined with phonic reading instruction helps young children at risk of reading failure. *Journal of Child Psychology and Psychiatry*, 45(2), 338–358.
8.  Ellis, N., Natsume, M., Stavropoulou, K., Hoxhallari, L., van Daal, V., Polyzoe, N., Tsipa, M, & Petalas, M. (2004). The effects of orthographic depth on learning to read alphabetic, syllabic, and logographic scripts. *Reading Research Quarterly*, 39, 438–468.
9.  Aro, M. & Wimmer, H. (2003). Learning to read: English in comparison to six more regular orthographies. *Applied Psycholinguistics*, 24, 621–635.
10. Wimmer, H., & Goswami, U. (1994). The influence of orthographic consistency on reading development: Word recognition in English and German children. *Cognition*, 51(1), 91–103.
11. Goswami, U., & East, M. (2000). Rhyme and analogy in beginning reading: Conceptual and methodological issues. *Applied Psycholinguistics*, 21, 63–93.
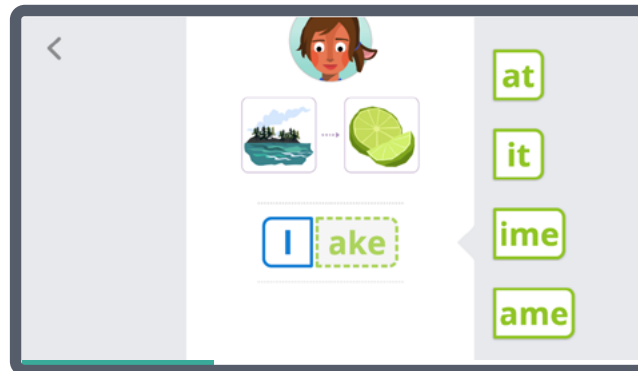
In *Picky Goblins,* students are provided an animation of a mouth forming each letter-sound to fine-tune their articulation of the sounds.



Letter shapes are introduced with a mnemonic, an object whose name begins with the letter's most common sound, that fades over time.



In *Rhyme Time,* students build words by changing only the first letters (onset).



In *Tongue Twist,* the word ending (rime) changes while the beginning stays constant.

**gate**

**germs**

# English rules

Some languages, like Spanish and Finnish, behave well when it comes to spelling. Not so with English. Spelling in our language has many ambiguities,[1–3] and a great number of rules around them. Some of the first rules that students face are the "magic e" (an 'e' at the end of a word makes the vowel say its name) and the hard and soft sounds of 'c' and 'g' (use the soft sound before 'i,' 'e,' or 'y'). Then there are rules for consonant digraphs and blends; vowel digraphs and dipthongs; r-controlled vowels; adding endings to words; and reading words with multiple syllables. In order for these rules to take root, students will need plenty of practice applying them. Our games provide not only instruction, but also plenty of practice to build on these skills.

" To learn a rule like hard/soft 'c'/'g,' students need to engage in discrimination practice—practice that requires them to determine when to apply strategies successfully.[4] "

**Danielle Damico**
Director of Learning Science, Amplify

**globe**

| RF.1.3.B | RF.1.3.A | RF.1.3.E | RF.2.3.C | RF.K.3.C |
|----------|----------|----------|----------|----------|
| RF.2.3.E | RF.2.3.B | RF.1.3.F | RF.2.3.D | RF.1.3.G |
| RF.K.3.B | RF.1.3.C | RF.2.3.A | RF.2.3.F | RF.3.3.C |

1. Aro, M. & Wimmer, H. (2003). Learning to read: English in comparison to six more regular orthographies. *Applied Psycholinguistics*, 24, 621–635.
2. Ellis, N., Natsume, M., Stavropoulou, K., Hoxhallari, L., van Daal, V., Polyzoe, N., Tsipa, M, & Petalas, M. (2004). The effects of orthographic depth on learning to read alphabetic, syllabic, and logographic scripts. *Reading Research Quarterly*, 39, 438–468.
3. Wimmer, H., & Goswami, U. (1994). The influence of orthographic consistency on reading development: Word recognition in English and German children. *Cognition*, 51(1), 91–103.
4. Carnine, D., Silbert, J., Kame'enui, E., Slocum, T. A. & Travers, S. (2016). Direct Instruction Reading, 6th Edition. Upper Saddle River, NJ: Pearson.

In *Sort It Out,* students are taught the hard and soft sounds for each letter and must swipe words to the correct—hard or soft—side of the screen. To scaffold their learning, students are taught which letters to look for after the 'g' or 'c' to know when the letter is making its hard or soft sound.

In *Grumpy Goblins*, students learn sound-spelling correspondences for consonant digraphs and vowel teams by feeding a goblin the piece of toast it names.

In *Curioso Crossing,* students practice reading words to apply multiple rules over time—words with consonant and vowel combinations, endings, and multiple-syllable types.

❝ I like how it moves at the kids' pace and is designed around their abilities at the time.❞

—Kindergarten teacher, New York

# Word-building and spelling help reading.

**Spelling and building** words help early decoders shore up their mental representations of words, which helps them become fluent readers.[1-3] In our program, they practice this through the process of chaining—for example, changing 'mat' to 'sat,' then 'sat' to 'sit.' This helps them move from using the first letter to using all of a word's letters to read.[4]

Once these basic skills are firm, students are ready for more advanced tasks—spelling, mixing, and re-mixing letters and word parts (from onset and rime to roots and affixes) to form an endless variety of words. Instruction in these structures (like affixes and root words) is crucial for beginning readers who lack the experience with mentally chunking large unknown words.[5]

| | | | | |
|---|---|---|---|---|
| RF.K.3.A | RF.1.3.C | RF.K.3.B | RF3.3.A | |
| RF.1.3.A | RF.1.3.F | RF.K.3.D | RF.3.3.B | RF.4.3.A |
| RF.1.3.B | RF.2.3.B | RF.K.2.E | RF.3.3.C | RF.5.3.A |

> "Word-building helps students' decoding skills, perhaps because it scaffolds the process of successfully attending to and decoding each grapheme position within a word, especially those positions the child might habitually neglect, such as the medial and final positions."

**Bruce McCandliss**
Lead Consultant

1. Ouellette, G. (2010). Orthographic learning in learning to spell: The roles of semantics and type of practice. *Journal of Experimental Child Psychology*, 107, 50–58.
2. Joshi, M., Treiman, R., Carreker, S., & Moats, L. C. (2008). How words cast their spell: Spelling is an integral part of learning the language, not a matter of memorization. *American Educator*, Winter 2008–2009, 5–16.
3. Conrad, N. J. (2008). From reading to spelling and spelling to reading: Transfer goes both ways. *Journal of Educational Psychology*, 100(4), 869–878.
4. McCandliss, B.D., Beck, I., Sandak, R., & Perfetti, C. (2003). Focusing attention on decoding for children with poor reading skills: A study of the Word Building intervention. *Scientific Studies of Reading*, 7(1),75–105.
5. Fox, B. J. (2012). Word identification strategies: Building phonics into a classroom reading program. Boston, MA: Pearson.
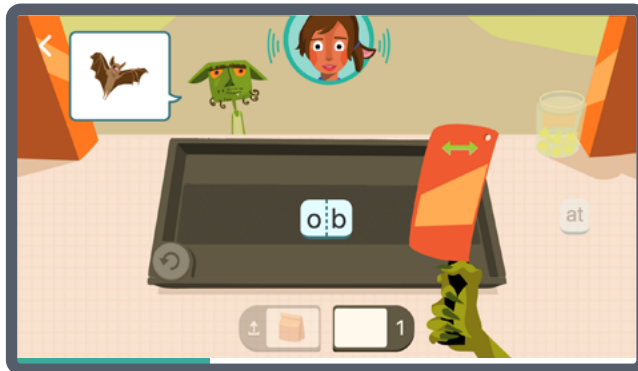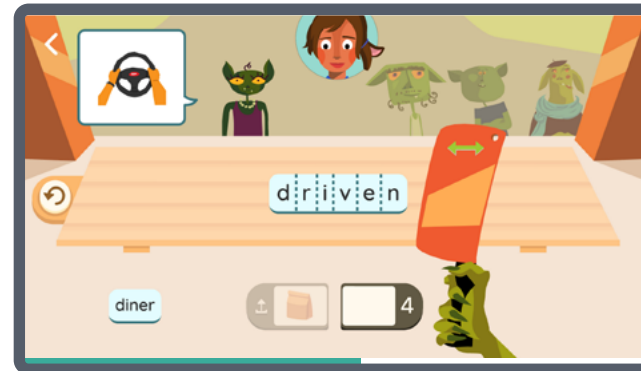
*Word City* is a chaining game. Students identify and manipulate the beginning, middle, and ending sounds in a series of words—for example, building *mom* from *tom* and, later, *form* from *farm*.
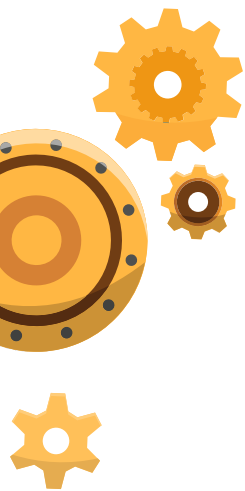


In *Word Slide*, students slide word part and letter tiles into the correct places to build words that follow rules, such as 'magic e,' to l- and r-controlled vowels, to inflected endings.



In *Food Truck*, students take on the role of a chef, creating words to satisfy their hungry goblin customers. Students assemble orders by chopping word parts and whole words into beginning sounds (onsets), ending sounds (rimes), individual letters, and blends.



In *Food Truck: Chef's Specials*, students reprise their role as chef, assembling orders by chopping multisyllabic words into bigger parts—roots and affixes.

# From accuracy to fluency

**Fluent reading** is automatic and effortless. Look at the word elephant, for example, and try not to see one in your head. It's only when students are fluent that they free up cognitive resources to make sense of what they read.[1–3] This fluency starts with reading individual letters, then builds—recognizing shorter 2–3-letter words on their own and in connected texts—before graduating into longer, more complex words and texts. Games like *Curioso Crossing* and *Story Lab* take advantage of proven strategies for boosting student fluency, giving them practice recognizing words in isolation with a large word set, and offering repeated readings with connected texts.[4–7]

| | | | | |
|---|---|---|---|---|
| RF.3.4 | RF.2.3.A | RF.K.3.C | RF.2.3.D | |
| RF.4.4 | RF.K.3.B | RF.1.3.C | RF.1.3.E | RF.2.3.F |
| RF.5.4 | RF.1.3.B | RF.2.3.C | RF.1.3.F | RF.1.3.G |

1. Share, D. L. (1995). Phonological recoding and self-teaching: Sine qua non of reading acquisition. *Cognition, 55*(2), 151–218.
2. Cummings, K. D., Dewey, E. N., Latimer, R. J., & Good, R. H. (2011). Pathways to word reading and decoding: The roles of automaticity and accuracy. *School Psychology Review, 40*(2), 284–295.
3. Willingham, D. T. (2017). *The Reading Mind: A Cognitive Approach to Understanding How the Mind Reads.* Jossey-Bass.
4. Rasinski, T., Homan, S., & Biggs, M. (2009). Teaching reading fluency to struggling readers: Method, materials, and evidence. *Reading & Writing Quarterly, 25*(2-3), 192–204
5. National Institute of Child Health and Human Development (NICHD). (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of scientific research literature on reading and its implications for reading instruction. Report of the subgroups* (NIH Publication No. 00-4754). Washington DC: US. Government Printing Office.
6. Samuels, S. J. (1979). The method of repeated readings. *The Reading Teacher, 41*, 756–760.
7. Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading: A meta-analysis. *Remedial and Special Education, 25*(4), 252–261.
8. Pikulski, J. J., & Chard, D. J. (2005). Fluency: Bridge between decoding and reading comprehension. *The Reading Teacher 58*(6), 510–519.
9. Stevens, E. A., Walker, M. A., & Vaughn, S. (2017). The effects of reading fluency interventions on the reading fluency and reading comprehension performance of elementary students with learning disabilities: A synthesis of the research from 2001 to 2014. *Journal of Learning Disabilities, 50*(5), 576–590.

"Story Lab incorporates components of effective repeated reading interventions, including: a model of fluent reading, multiple opportunities to read the same passage, an indication of rate and improvement in rate upon repeated readings, and connections to comprehension.[7–9]"

**Danielle Damico**
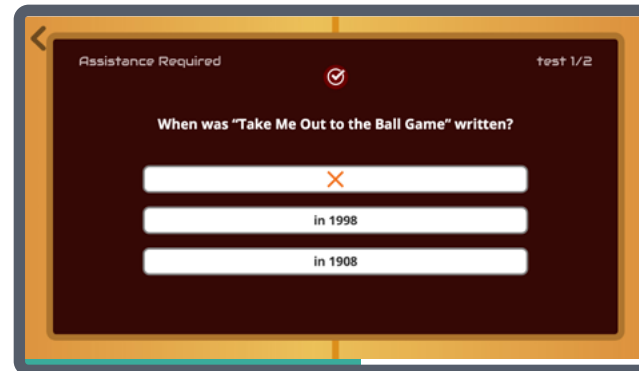Director of Learning Science, Amplify

In *Curioso Crossing,* students first practice building accuracy reading words with phonics features they just learned in other games.
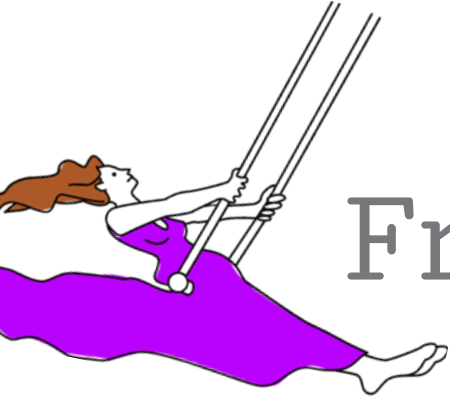


After building decoding accuracy, students encounter a fluency round: The game is against the clock and they have only three lives to reach safety.



In *Story Lab*, students hear a model of reading with appropriate pace and expression. They then read the text themselves (with opportunities to adjust speed) and complete embedded cloze items, followed by comprehension questions at the end.



Students receive immediate feedback on their performance and are challenged to improve with each repeated reading.

# From decoding to meaning

Boost Reading creates a unique digital profile for every student and updates it in real time. For instance, the program automatically monitors which spelling patterns, word features (prefixes and suffixes), and phonics rules a student has recently learned. The system then draws from a large bank of short decodable texts to deliver varied and multiple opportunities over time to decode at precisely the student's level and move them toward fluency. [1, 2]

" Experts suggest that students likely benefit most from decodable text when they have learned enough letter sounds to sound out words, but do not have strong enough skills to handle the full range of patterns in English that might appear in uncontrolled text.[3] This is the transition between the partial alphabetic and full alphabetic stages.[4] "

**Heidi Anne E. Mesmer**
Virginia Tech

RF.K.3    RF.K.4
RF.1.3    RF.1.4
RF.2.3    RF.2.4

1. Carnine, D., Silbert, J., Kame'enui, E., Slocum, T. A. & Travers, S. (2016). *Direct Instruction Reading*, 6th Edition. Upper Saddle River, NJ: Pearson.
2. Toppino, T. C., and Gerbier, E. (2014). About practice: Repetition, spacing, and abstraction. *The Psychology of Learning and Motivation, 60*, 113–189.
3. Mesmer, H. A. E. (2001). Decodable text: A review of what we know. *Reading Research and Instruction, 40*(2),121–142.
4. Ehri, L. C. (2005). Development of sight word reading: Phases and findings. In M. J. Snowling, & C. Hulme (Eds.), *The Science of Reading: A Handbook.* (pp. 135–154). Oxford: Blackwell Publishing.
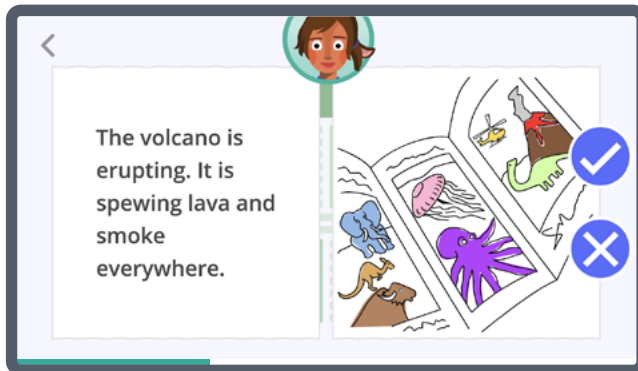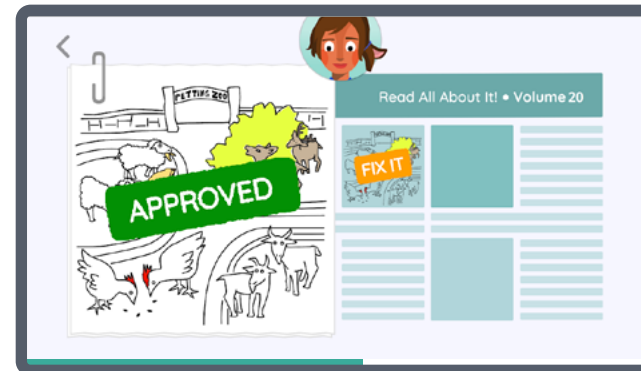
As editors of the *Bookerton Bee* newspaper, students must determine whether a descriptive sentence matches the accompanying picture.



The game automatically highlights anomalous areas of picture and text if students need extra support.



Decodable text difficulty ramps as students learn new phonics elements—in other games—towards advanced features such as multisyllabic words.



At the end of a level, student work is assembled and published in a brand new edition of the *Bee*.

# Gap-filling inferences

Writers make assumptions about what can be left unstated. For instance, when reading the sentence "Carla forgot her umbrella and got very wet today," good readers will use their prior knowledge to conclude that it rained. Weaker readers who fail to make these gap-filling inferences wind up with holes in their mental model, down which comprehension disappears.[1] We built games like *Storyboard* to give students lots of practice to help plug up those holes.

" Students, particularly those who struggle with reading comprehension, should be given the opportunity to practice making gap-filling inferences with explicit instruction when needed.[2–4] "

**Jane Oakhill**
University of Sussex

RL.K.1  RI.K.1
RL.1.1  RI.1.1

1. Cain, K. & Oakhill, J. V. (1999). Inference making ability and its relation to comprehension failure in young children. *Reading and Writing, 11*(5), 489.
2. Elleman, E. M. (2017). Examining the impact of inference instruction on the literal and inferential comprehension of skilled and less skilled readers: A meta-analytic review. *Journal of Educational Psychology, 109*(6), 761–781.
3. McGee, A., & Johnson, H. (2003). The effect of inference training on skilled and less skilled comprehenders. *Educational Psychology, 23*(1), 49–59.
4. Yuill, N., & Oakhill, J. (1988). Effects of inference awareness training on poor reading comprehension. *Applied Cognitive Psychology, 2*(1), 33–45.
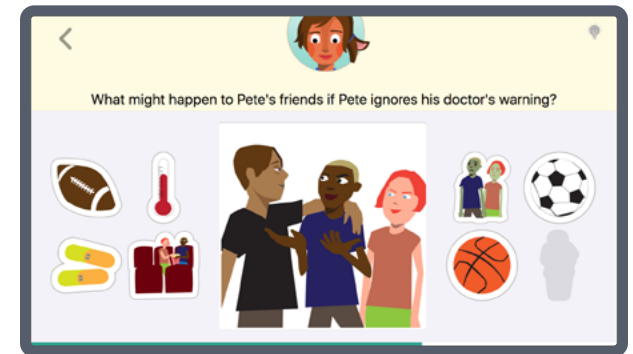
Carla forgot her umbrella and got very wet today.

In *Storyboard,* students play detective, using their background knowledge to find information that authors left out.



Though the doctor warned Pete to stay home, Pete hung out with his friends instead.

The game gives them lots of gap-filling inference practice with sentences that gradually increase in complexity.



What might happen to Pete's friends if Pete ignores his doctor's warning?

When extra support is needed, a hint probes the type of information left out—a research-based strategy. [2, 5-6]

" Students enjoy practicing reading and reading skills through this program. It was made with young minds in mind."

—2nd-grade teacher, California

or

so

but

# Connectives:
# a new kind of vocabulary

**Connectives are** special words that tie clauses, sentences, and ideas together. They signal that two ideas are related and give insight into exactly how. For instance, they can be additive ("and"), causal ("because"), adversative ("but"), or temporal ("before").[1] But just defining the meaning of connective words isn't enough for many students. The meaning of connectives should be taught in context through varied examples,[2–4] which Boost Reading does through the game *Connect It!*

" Understanding connectives is a critical skill in reading comprehension. It helps readers connect ideas within and across sentences to construct a coherent mental representation of the text. [2, 3, 5] "

**Art Graesser**
University of Memphis

L.2.3

1.  Halliday, M. A. K. & Hasan, R. (1976). *Cohesion in English*. London: Longmans.
2.  Crosson, A. C. & Lesaux, N. K. (2013). Does knowledge of connectives play a unique role in the reading comprehension of English learners and English-only students? *Journal of Research in Reading, 36*(3), 241–260.
3.  Mesmer, A. E. (2017). Connectives in sentences. In *Teaching Skills for Complex Text: Deepening Close Reading in the Classroom*. New York: Teachers College Press.
4.  Oakhill, J., Cain, K., & Elbro, C. (2015). Sentences and their connections. In *Understanding and teaching reading comprehension: A handbook* (pp. 69–81). New York: Routledge.
5.  Graesser, A. C., McNamara, D. S., & Louwerse, M. M. (2003). What do readers need to learn in order to process coherence relations in narrative and expository texts? In A.P. Sweet & C.E. Snow (Eds.), *Rethinking reading comprehension.* (pp. 82–98). New York: Guilford Press.

*Connect It!* uses sentence combining: [4, 6] Students practice identifying how two clauses are related by choosing the connective word that fits best to create a coherent sentence.



With repeated practice across a variety of clauses and sentences, students learn multiple contexts for each connective.



When students struggle, they are explicitly taught the meaning of the connective and how it impacts the clauses it connects (e.g., "We use *but* when the second idea tells us something different than the first idea.").



The software adapts to give repeated practice on any connective a student missed.

# Making text coherent

Writers avoid repeating things like characters' names, assuming readers can figure out who they are referring to when they use pronouns. The term for this is anaphora. Some beginning readers can't reliably figure out who a pronoun is referring to, especially when there is ambiguity,[1] when there are multiple sentences between the pronoun and its antecedent,[2] and when pronouns replace longer phrases or clauses.[3] The game *Unmask That* lets students practice this skill and see how sentences are tied together to make a coherent whole.

" Elementary students should receive explicit instruction in identifying anaphor-antecedent relationships to improve sentence-level comprehension.[4–5] Unmask That provides that instruction and practice in a novel way that kids enjoy. "

**Jane Oakhill**
University of Sussex

L.1.1
L.2.1
L.3.1

1. Oakhill, J., Cain, K., & Elbro, C. (2015). Sentences and their connections. In *Understanding and teaching reading comprehension: A handbook* (pp. 69–81). New York: Routledge.
2. Yuill, N. & Oakhill, J. (1988). Understanding of anaphoric relations in skilled and less skilled comprehenders. *British Journal of Psychology, 79*, 173–186.
3. Barnitz, J. G. (1980). Syntactic effects of reading comprehension of pronoun-referent structures by children in grades two, four, and six. *Reading Research Quarterly, 15*(2), 268–289.
4. Baumann, J. F. (1986). Teaching third-grade students to comprehend anaphoric relationships: The application of a direct instruction model. *Reading Research Quarterly, 21*(1), 70–90.
5. Dommes, P., Gersten, R., & Carnine, D. (1984). Instructional procedures for increasing skill-deficient fourth graders' comprehension of syntactic structures. *Educational Psychology, 4*(2), 155–165.
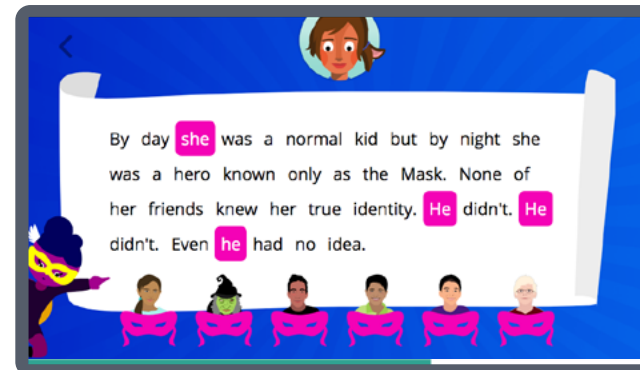
In *Unmask That*, students collect characters and objects by "unmasking" them—resolving each anaphora by finding its antecedent.

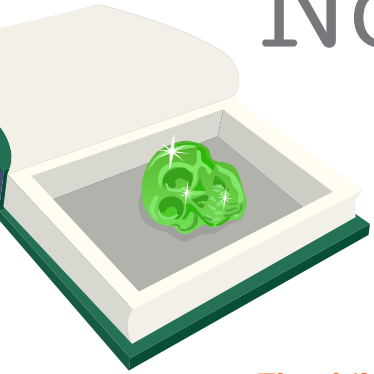

Students receive extra support when they need it.



Passages become more diverse and complex as students' skills and confidence grow—e.g.,passages include plural pronouns, noun substitutions, longer passages, increased distance between pronoun and antecedent.



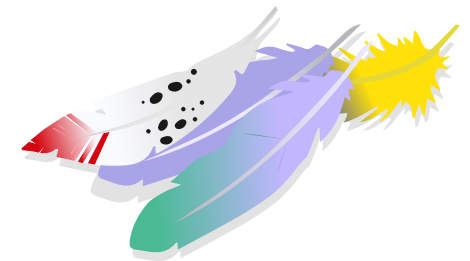Students get to make their own story segment with the max they collect.

# Noticing figurative language

**The ability to** recognize the difference between a face that is "white as a sheet" and one that is simply "looking scared" affects our understanding of text. Figurative language lets readers build stronger mental models and have a fuller understanding of what they're reading. We support this work with our game CodeX. By looking at the same text, both with and without figurative language, students strengthen their understanding of how figurative language is used,[1] and even how to use it themselves.[2]

" Once students gain an awareness of figurative language, they are then able to develop the ability to comprehend the meaning and purpose of figurative language in their texts, as well as to think figuratively.[2] "

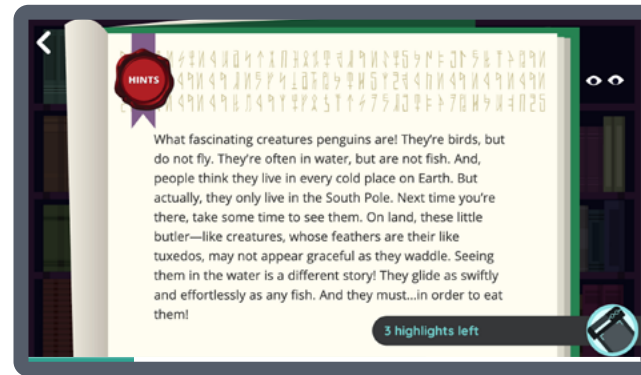**Jenna Marks**
Senior Learning Scientist, Amplify

RL.4.1      RL.5.1
RL.4.4      RL.5.4

1.  Bransford, J. D., & Schwartz, D. L. (1999). Rethinking transfer: A simple proposal with multiple implications. *Review of Research in Education, 24*, 61–100.
2.  Palmer, B. C., & Brooks, M. A. (2004). Reading until the cows come home: Figurative language and reading comprehension. *Journal of Adolescent & Adult Literacy, 47*(5), 370–379.
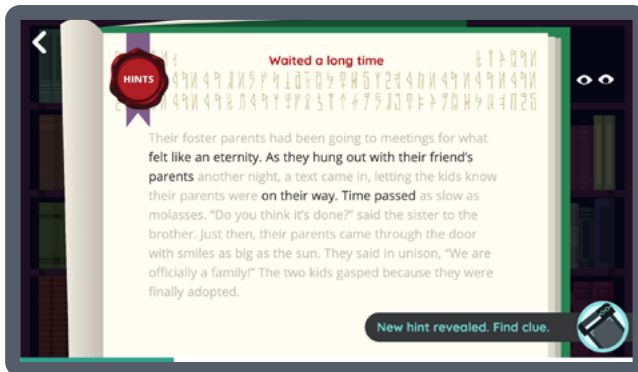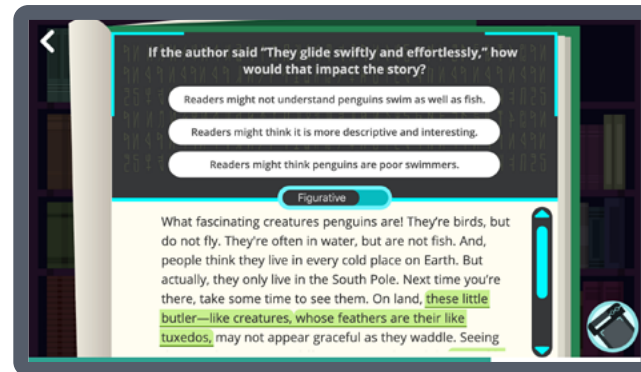
In *CodeX*, students begin their search in a library filled with hidden treasures, which can be located by identifying clues embedded in the books.



Along the way, they receive guidance from an electronic scanner that reveals parts of the text have been "written in code" using similes, metaphors, personification, and other descriptive language.



The game provides scaffolds to support students with this difficult task: hieroglyphics that can be "deciphered" to reveal hints, and reduced distractors to narrow their focus.



The final challenge leading to the hidden treasure enables students to compare figurative and literal translations within the text to describe their impact.

# Building syntactic awareness

We use our understanding of word order and grammar to help us make meaning of sentences[1]—a skill known as syntactic awareness. Students with poor syntactic awareness have trouble breaking up and analyzing sentences at the right parts, or syntactic boundaries, which negatively impacts their reading comprehension.[2,3] Our game Message in a Bottle trains students in this area by having them unscramble sentences and offering scaffolded support by way of grouping related words.
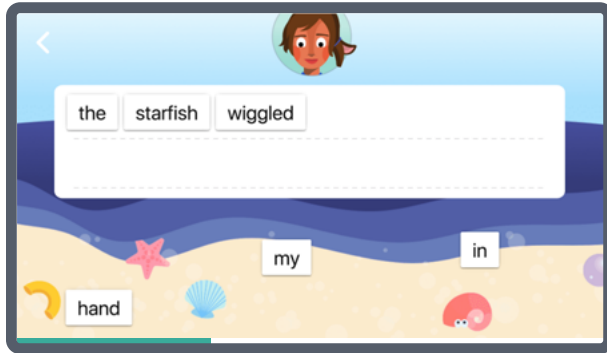
L.1.1
L.2.1

" Syntactic awareness, rather than syntactic knowledge (i.e., simply understanding spoken sentences of increasing syntactic complexity), is important for reading comprehension.[2,4] Students need practice parsing complex sentences in tasks such as putting jumbled sentences in order. "

**Jane Oakhill**
University of Sussex

1.  Cain, K., & Oakhill, J. (2007). Reading comprehension difficulties: Correlates, causes and consequences. In K. Cain & J. Oakhill (Eds.), *Children's comprehension problems in oral and written language: A cognitive perspective* (pp. 41–74). New York: Guilford Press.
2.  Nation, K., & Snowling, M. J. (2000). Factors influencing syntactic awareness skills in normal readers and poor comprehenders. *Applied Psycholinguistics, 21*, 229–241.
3.  Scott, C. M. (2009). A case for the sentence in reading comprehension. *Language, Speech, & Hearing Services in Schools, 40*(2), 184–191.
4.  Oakhill, J., Cain, K., & Elbro, C. (2015). Sentences and their connections. In *Understanding and teaching reading comprehension: A handbook* (pp. 69–81). New York: Routledge.
5.  Weaver, P. A. (1979). Improving reading comprehension: Effects of sentence organization instruction. *Reading Research Quarterly, 15*(1), 129–146.
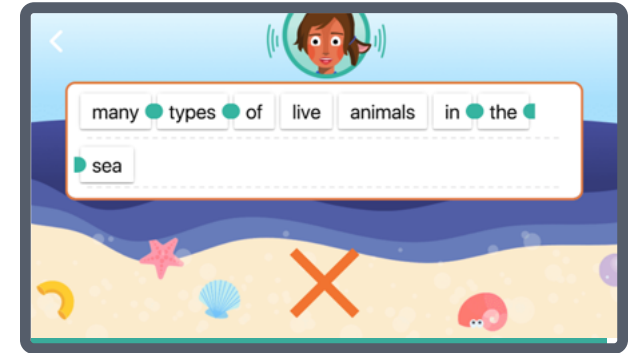
In *Message in a Bottle,* students unscramble sentences.



The length and complexity of the sentences increase as students excel in the skill.



Scaffolding is provided through word grouping, which has been shown to significantly improve reading comprehension. [5]

" My favorite Boost Reading game is *Message in a Bottle.* I like to unscramble sentences—they're fun to do. "

—2nd-grade student, Connecticut

# Using text structures
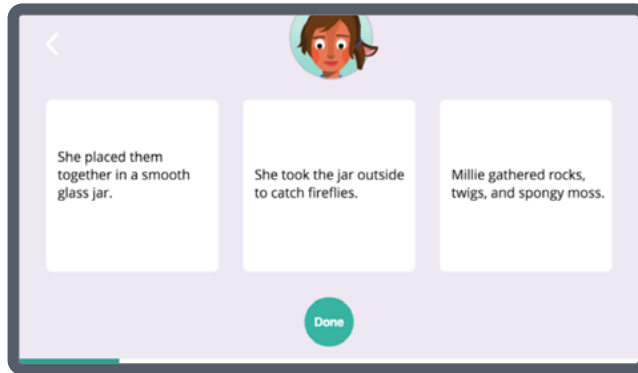
One way proficient readers make sense of informational texts is by taking advantage of the similar ways they're organized. Knowledge of common patterns—or text structures—helps readers connect ideas into a coherent mental model.[1] Boost Reading teaches the four most common structures—sequence, chronology, cause/effect, and problem/solution—through guided and independent practice with specially constructed texts.[2] You can see this in games like *Show Off* and *Because This, That.*

RI.1.3    RI.2.8
RI.2.3    RI.3.3
RI.1.8    RI.3.8

" Teaching students to recognize the key words associated with common structures, and to represent the ideas in a visual format through graphic organizers, improves student reading comprehension,[2, 3] particularly for students who are struggling.[4, 5] "

**Jane Oakhill**
University of Sussex
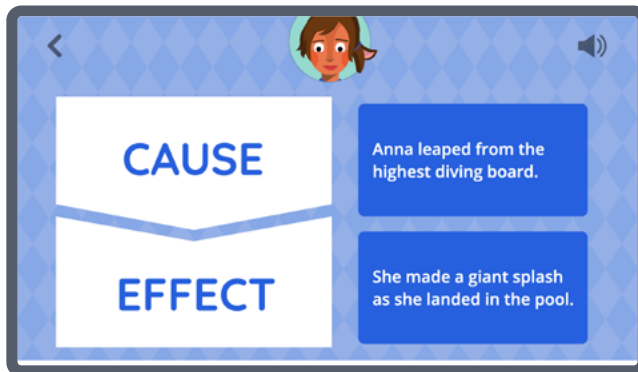
1. Oakhill, J., Cain, K., & Elbro, C. (2015). Finding and using text structure when reading. In Understanding and teaching reading comprehension: A handbook (pp. 82–93). New York: Routledge.
2. Al Otaiba, S. L., Connor, C. M., & Crowe, E. (2017). Promise and feasibility of teaching expository text structure: A primary grade pilot study. Reading & Writing, Advance online publication.
3. Pyle, N. et al. (2017). Effects of expository text structure interventions on comprehension: A meta-analysis. Reading Research Quarterly, 52(4), 469–501.
4. Hebert, M., Brohaty, J. J., & Nelson, J. R. (2016). The effects of text structure instruction on expository reading comprehension: A meta-analysis. Journal of Educational Psychology, 108(5). 609–629.
5. Williams, J. P. (2005). Instruction in reading comprehension for primary-grade students: A focus on text structure. The Journal of Special Education, 39(1), 6–18.
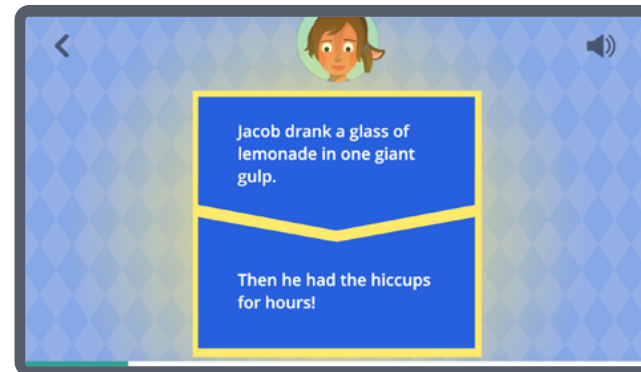
In *Show Off,* students arrange sequences in order.



Scaffolding is provided with illustration cues for students who need it.



In *Because This, That,* students map sentences to cause/effect or problem/solution graphic organizers.



Support highlights signal words such as *because* and *so.*

# What they never told you about text schema

When you visit a restaurant, you know there will be a menu, a server, and a check—you know the schema for restaurants.[1] Similarly, when proficient readers encounter a new passage, they're quickly able to identify its schema[2]: fairy tale, mystery, biography, procedure, explanation, etc. Each schema has its own set of rules that authors follow to organize the text and select words and syntactic structures.[3]  We built *Tube Tales* to help beginning readers learn to recognize common schemas so they're better able to follow their conventions and create an accurate mental model as they read.

" Research suggests that when students are taught about the different ways authors organize text, they are better able to recall details about texts, and have better overall reading comprehension.[4] "
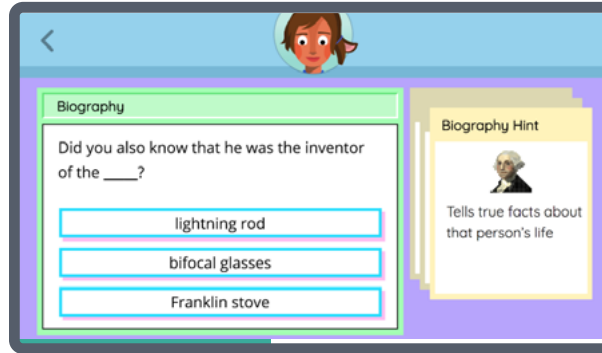
**Art Graesser**
University of Memphis

RI.2.5        RI.3.5
RL.2.10     RL.3.10
RI.2.10     RI.3.10

1.  Schank, R. C., & Abelson, R. P. (2013). *Scripts, plans, goals, and understanding: An inquiry into human knowledge structures.* Psychology Press.
2.  Mandler, J. M., & Johnson, N. S. (1977). Remembrance of things parsed: Story structure and recall. *Cognitive Psychology, 9,* 111–151.
3.  Littlefair, A. (1991). *Reading All Types of Writing: The Importance of Genre and Register for Reading Development.* Milton Keynes: Open University Press.
4.  Meyer, B. F., & Ray, M. N. (2011). Structure strategy interventions: Increasing reading comprehension of expository text. *International Electronic Journal of Elementary Education, 4*(1), 127–152.

In *Tube Tales*, students explore a book factory, but the machines have broken. Their first task is to create new books based on common schema.



They learn the features of a schema such as biography by building their own passages incorporating each feature.



Students then help the factory's robots put books into the correct places by identifying which schema each book is based on. If needed, a hint reminds them of the features for each schema until they become automatic.

" Boost Reading is making things fun because there are games when you read. You get to read the passage and then you have to answer questions after reading. So it's not like you read and then that's it. It's more than just reading. "

—4th-grade student, Connecticut
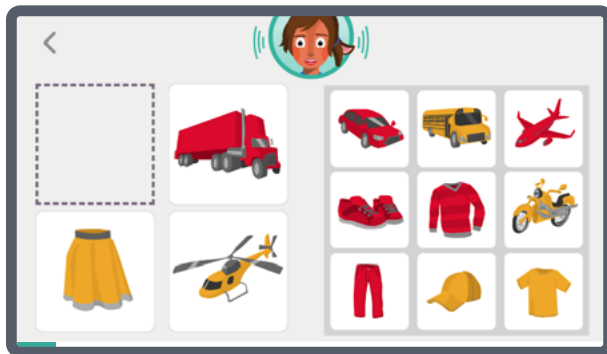
# Cognitive flexibility

**Beginning readers** find it hard to pay attention to both the sound and meaning of a word at the same time—an ability called cognitive flexibility.[1,2] As it turns out, students with better cognitive flexibility are also better comprehenders.[3] Building on researcher Kelly Cartwright's work, we designed *Super Match* to train students to process both sound and meaning simultaneously, using a method that improves not only students' cognitive flexibility, but also their reading comprehension.[4]

" Super Match does an excellent job recreating this simple task that research shows can increase young readers' cognitive flexibility and reading comprehension. Plus, it's a lot of fun."
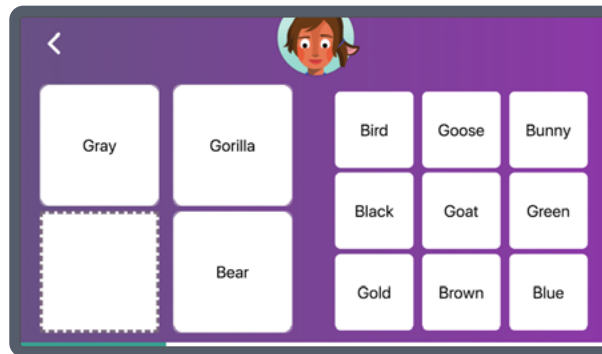
**Kelly Cartwright**
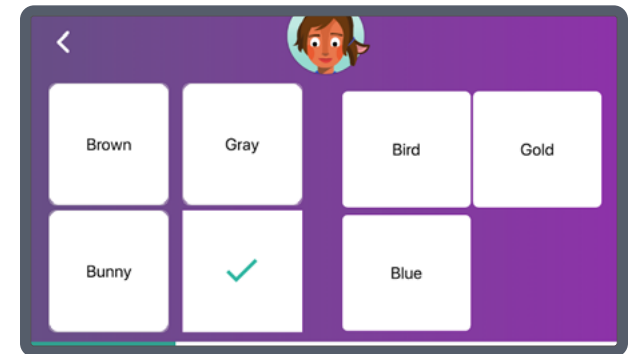Christopher Newport University

RF.1.3
L.1.5.A
L.1.5.B

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1.  Adams, M. J. (1990). *Beginning to read: Thinking and learning about print.* Cambridge, MA: MIT Press.
2.  Bialystock, E. & Niccols, A. (1989). Children's control over attention to phonological and semantic properties of words. *Journal of Psycholinguistic Research, 18*(4). 369–387.
3.  Cartwright, K. B., Marshall, T. R., Dandy, K. L., & Isaac, M. C. (2010). The development of graphophonological-semantic cognitive flexibility and its contribution to reading comprehension in beginning readers. *Journal of Cognition and Development, 11*(1), 61–85.
4.  Cartwright, K. B. (2002). Cognitive development and reading: The relation of reading-specific multiple classification skill to reading comprehension in elementary school children. *Journal of Educational Psychology, 94*(1), 56–63.

*Super Match* builds readers' cognitive flexibility. Starting with pictures, students are asked to match cards on two parameters (color and type) to find the missing item (in this case, a red item of clothing).



Then, students transition to words. To solve the puzzle they have to sort by both initial sound and semantic category.
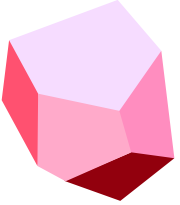


When students struggle, they get explicit feedback and, if they continue to have difficulty, the game adapts, reducing the number of distractors temporarily.

**❝ It focuses on the skills they need to focus on to become better readers.❞**

—3rd-grade teacher, California

# Monitoring comprehension

When you read something that doesn't make sense, you stop, re-read, and try to figure it out. This is called comprehension monitoring. But weaker readers just keep going. It's not just that they fail to figure it out, but also that they fail to notice they didn't figure it out in the first place.[1–4] Beginning readers may struggle with local anomalies—single words they don't understand. Later readers often miss anomalies that require them to integrate information that's separated by several sentences.[5] The game *Sloppy Scrolls* trains students to be more aware of the need to monitor comprehension by having them actively hunt for these anomalies.

RL.2.10
RL.3.10
RL.4.10

> " Proficient readers continuously check to make sure what they just read matches the mental model that they have created by attempting to integrate the new information.[6] Targeted intervention has been shown to help weak comprehenders do the same.[4] "
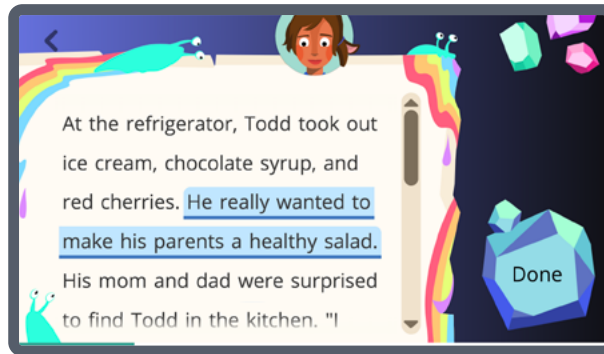
**Jane Oakhill**
University of Sussex

1. Englert, C. S., Hiebert, E. H., & Stewart, S. R. (1988). Detecting and correcting inconsistencies in the monitoring of expository prose. *The Journal of Educational Research, 81*(4), 221–227.
2. Helder, A., Van Leijenhorst, L., & van den Broek, P. (2016). Coherence monitoring by good and poor comprehenders in elementary school: Comparing offline and online measures. *Learning and Individual Differences, 48,* 17–23.
3. Markman, E. M. (1979). Realizing that you don't understand: Elementary school children's awareness of inconsistencies. *Child Development, 50*(3), 643–655.
4. Rubman, C. N., & Salatas Waters, H. (2000). A, B Seeing: The role of constructive processes in children's comprehension monitoring. *Journal of Educational Psychology, 92*(3), 503–514.
5. Oakhill, J., Hartt, J., & Samols, D. (2005). Levels of comprehension monitoring and working memory in poor comprehenders. *Reading and Writing, 18,* 657–686.
6. Oakhill, J., Cain, K., & Elbro, C. (2015). Does it make sense? Monitoring for meaning. In *Understanding and teaching reading comprehension: A handbook* (pp. 94–104). New York: Routledge.

In *Sloppy Scrolls,* students have to restore ancient scrolls that have lost their magic and contain anomalies.



If they pick incorrectly, the game provides scaffolding by presenting them with a sentence in which the model for the passage is established...



... and then asks them to find the sentence that contradicts it. But students have to be careful not to get tricked: some scrolls actually have no anomalies.

" Sometimes it is hard to motivate students who are unable to read independently. I have really noticed my low readers excited about Amplify. "

—3rd-grade teacher, Ohio

# Building and refining the mental model

Any time students visualize what they're reading, they're actually enhancing their comprehension.[2] By visualizing the text, they build mental models they'll refer to and update as they read. Our *Director's Cut* game reinforces this model-building by having students manipulate story-related objects and make storyboards. These strategies are proven to help with monitoring comprehension and deriving the inferences needed to construct and update a coherent mental model for an evolving text.[1–4]

" Mental models need to be continuously updated as the reader considers the changing landscape of the text and integrates this information with background knowledge.[1, 2] "

**Jennifer Zoski**
Learning Scientist, Amplify

RL.3.1
RL.4.1
RL.5.1

1. De Koning, B. B., & van der Schoot, M. (2013). Becoming part of the story! Refueling the interest in visualization strategies for reading comprehension. *Educational Psychology Review, 25*(2), 261–287.
2. Graesser, A. C., Singer, M., & Trabasso, T. (1994). Constructing inferences during narrative text comprehension. *Psychological Review, 101*(3), 371–395.
3. Glenberg, A. M., Gutierrez, T., Levin, J. R., Japuntich, S., & Kaschak, M. P. (2004). Activity and imagined activity can enhance young children's reading comprehension. *Journal of educational psychology, 96*(3), 424.
4. Rubman, C. N., & Salatas Waters, H. (2000). A, B Seeing: The role of constructive processes in children's comprehension monitoring. *Journal of Educational Psychology, ,92*(3), 503–514.

In *Director's Cut*, students practice building and updating mental models of passage-length texts by creating a visual representation of different frames in a "movie."



As the assistant to the director, the student is responsible for drawing out the scene based on the director's screenplay.



For each frame, students read a short passage and must develop a mental model of the characters' actions, events, feelings, thoughts, and motivations, and use that mental model to determine the correct character, set pieces, and "thought bubbles" to add to a storyboard scene.



When students choose an incorrect picture or forget to choose an essential story element, they are given a hint in the form of a tomato splat for an incorrect image and/ or a plus sign for ones that are missing.

# Inference and evidence

**State test writers** have become fond of two-part comprehension questions: the first, asking students to make an inference; the second, asking them to identify evidence that supports their inference. This two-part combination can really stump students.[1] Boost Reading gives intensive practice with this format with games like *Field Observer* and *Curious Cases,* where students infer character goals and motivations, then select evidence from the text to justify the inference.

"Inference practice helps all students.[2–4] For example, instruction and guided practice in identifying the internal states of story characters, which are often not explicitly stated, improves performance both on inferential questions and overall comprehension.[5, 6]"

**Jane Oakhill**
University of Sussex

| | | |
|---|---|---|
| RL.2.1 | RI.3.1 | |
| RI.2.1 | RL.4.1 | RL.5.1 |
| RL.3.1 | RI.4.1 | RI.5.1 |

1. Cain, K., Oakhill, J. V., Barnes, M. A., & Bryant, P. (2001). Comprehension skill, inference-making ability, and their relation to knowledge. *Memory & Cognition, 29*(6), 850–859.
2. Elleman, E. M. (2017). Examining the impact of inference instruction on the literal and inferential comprehension of skilled and less skilled readers: A meta-analytic review. *Journal of Educational Psychology, 109*(6), 761–781.
3. McGee, A., & Johnson, H. (2003). The effect of inference training on skilled and less skilled comprehenders. *Educational Psychology, 23*(1), 49–59.
4. Yuill, N., & Oakhill, J. (1988). Effects of inference awareness training on poor reading comprehension. *Applied Cognitive Psychology, 2*(1), 33–45.
5. Dunning, D. B. (1992). *Instructional questions that clarify story characters' feelings and motivations: Their effect on students' narrative comprehension*. (Tech. Rep. No. 563). Champaign: University of Illinois Center for the Study of Reading. Retrieved from https://core.ac.uk/download/pdf/4826277.pdf.
6. McTigue, E., Douglass, A., Wright, K. L., Hodges, T. S., & Franks, A. D. (2015). Beyond the story map: Inferential comprehension via character perspective. *The Reading Teacher, 69*(1), 91–101.
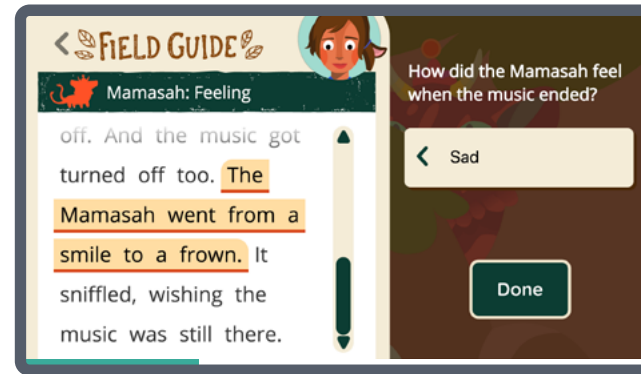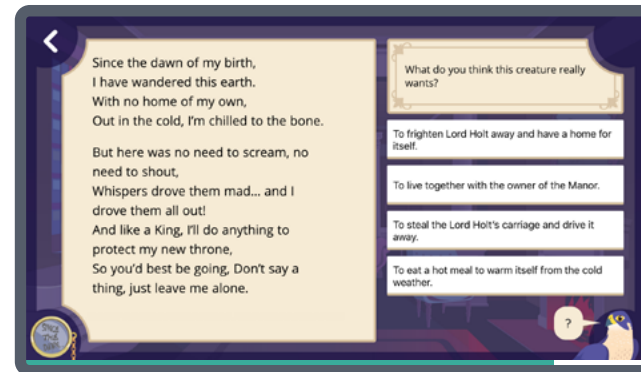
In *Field Observer,* students hunt for new species of Curioso—strange and interesting creatures they will discover and photograph.



They read about the creature they find in their field guide, make an inference about the new species, and highlight the evidence in the text that supports their inference.



In *Curious Cases*, students gather and analyze clues to make inferences and trap monsters lurking within the mysterious mansion.



Once again, they must support their inferences with evidence.

# Discerning character traits

Readers who can identify a character's traits—curious, courageous, carefree—from their actions or dialogue are better comprehenders. They understand what motivates a character's behaviors and reactions to story events.[1–3] Most students get only occasional chances to think and answer trait questions in class. To fill this gap, we designed *Best Buddy* to give students dozens of opportunities to practice identifying character traits. When they're ready, they move on to *Yearbook*, where they get to practice this skill using text evidence.

RL.1.3
RL2.3   RL.4.3
RL.3.3   RL.5.3

" Students who receive instruction and guided practice in identifying character emotions and traits and relating them to character actions in the story demonstrate a greater understanding of character perspectives and plot events, and are better at answering inferential comprehension questions about narratives. [4, 5]"
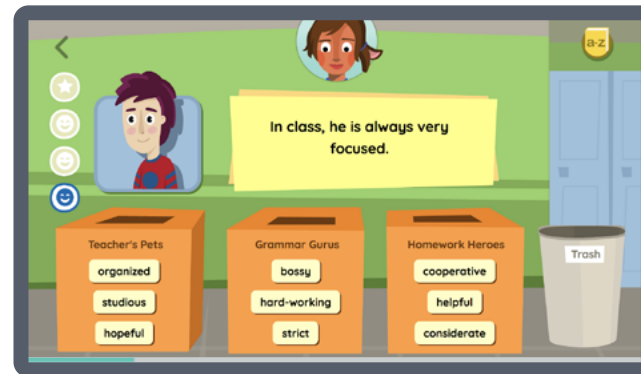
**Kelly Cartwright**
Christopher Newport University

1. Bower, G. H., & Morrow, D. G. (1990). Mental models in narrative comprehension. *Science, 247,* 44–48.
2. Diergarten, A. K., & Nieding, G. (2016). Online emotional inferences in written and auditory texts: A study with children and adults. *Reading & Writing, 29,* 1383–1407.
3. Westby, C. E. (2011). Assessing and remediating text comprehension problems. In A. G. Camhi & H. W. Catts (Eds.), *Language and Reading Disabilities* (pp. 163–2225). Boston: Pearson.
4. Dunning, D. B. (1992). *Instructional questions that clarify story characters' feelings and motivations: Their effect on students' narrative comprehension.* (Tech. Rep. No. 563). Champaign: University of Illinois Center for the Study of Reading. Retrieved from https://core.ac.uk/download/pdf/4826277.pdf.
5. McTigue, E., Douglass, A., Wright, K. L., Hodges, T. S., & Franks, A. D. (2015). Beyond the story map: Inferential comprehension via character perspective. *The Reading Teacher, 69*(1), 91–101.
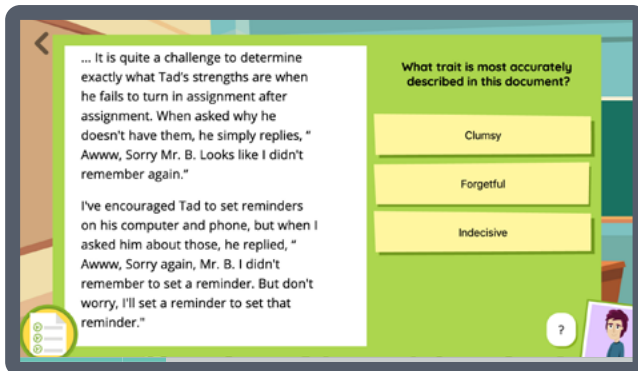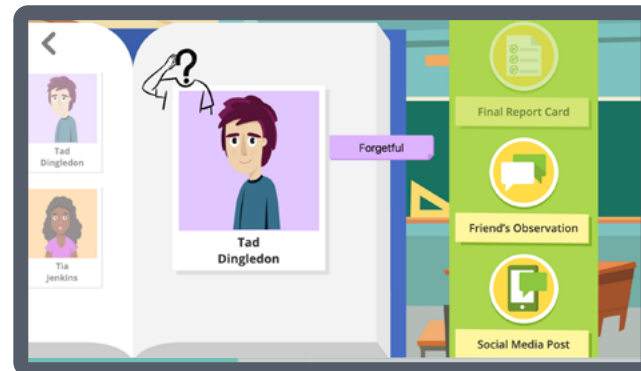
In *Best Buddy,* students identify traits for characters. The game includes over 50 traits.



Students use what their buddies say and do in order to figure out what traits describe them and thus what school club fits them best.



In *Yearbook*, students practice identifying character traits based on text evidence by reading notes, letters, and text messages and using that information to pick the best superlative for their classmates' yearbook entries.



Across the two games, the difficulty of clues and evidence required increases as student expertise grows.

# What's the big idea?

Identifying the main idea in a passage is hard, especially for beginning readers who are not used to summarizing or constructing something that isn't explicitly stated. It is, however, an essential skill both for remembering key points and connecting a string of ideas in a longer piece.[1, 2]

We built *What's the Big Idea* using the work of renowned researcher Ed Kame'enui. By teaching main ideas through picture-stories, and then building towards text,[1] teachers improve students' abilities to identify the main idea,[3] as well as their overall reading comprehension.[2] As texts become more complex, students must differentiate between the main idea of a portion of a text versus that of a *whole* text, then identify details that support them. Interventions like this one teach and provide multiple opportunities to practice these concepts, which improves students' ability to identify the main idea and comprehension passages.[3, 4]

"Jerome Axelrod[4] characterized main idea as 'the hub in the wheel of comprehension.' Starting with pictures before moving to text reduces memory demands and creates a less ambiguous way to teach the concept."
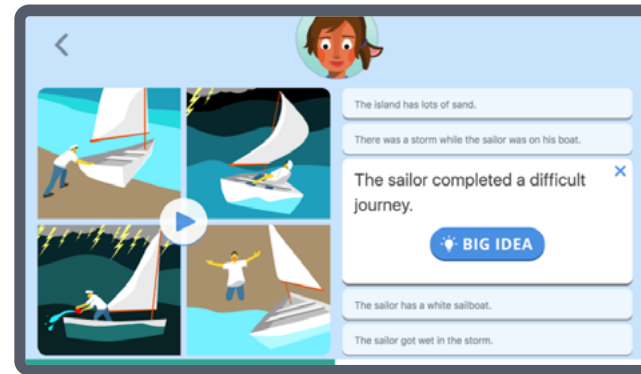
**Ed Kame'enui**
University of Oregon

RI.K.2  RI.2.2  RI.4.2
RI.1.2  RI.3.2  RI.5.2

1. Kame'enui, E. J. (1986). Main idea instruction for low performers: A direct instruction analysis. In J. F. Baumann (Ed.), *Teaching main idea comprehension* (pp. 239–276). Newark, DE: International Reading Association.
2. Kim, W., Linan-Thompson, S., & Misquitta, R. (2012). Critical factors in reading comprehension instruction for students with learning disabilities: A research synthesis. *Learning Disabilities Research & Practice, 27*(2). 66–78.
3. Baumann, J. F. (1984). The effectiveness of a direct instruction paradigm for teaching main idea comprehension. *Reading Research Quarterly, 20*(1), 93–115.
4. Boudah, D. J. (2013). The Main Idea Strategy: A Strategy to Improve Reading Comprehension Through Inferential Thinking. *Intervention in School and Clinic, 49*(3), 148–155.
5. Axelrod, J. (1975). Getting the main idea is still the main idea. *Journal of Reading, 18*(5), 383–387.
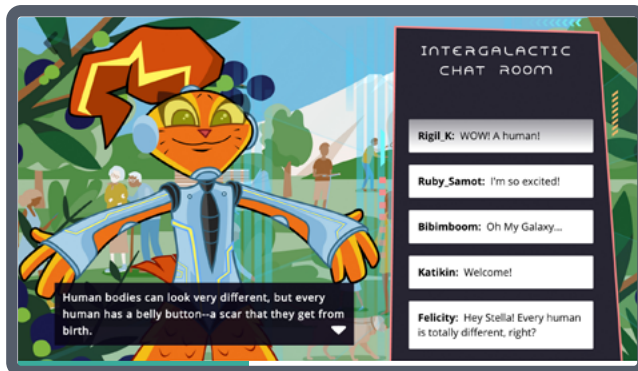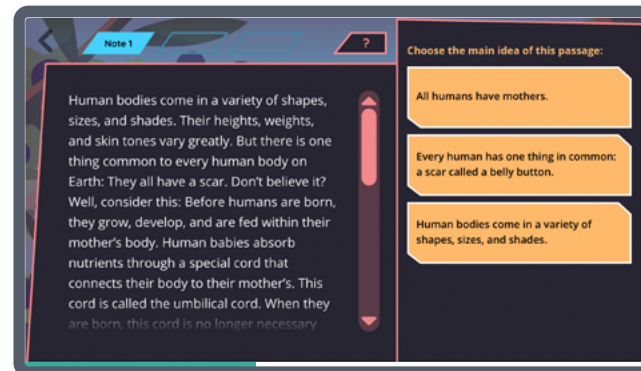
In *What's the Big Idea*, students first practice finding the main idea for a single picture. They are taught how to distinguish the main idea from supporting details.



Then they move on to more challenging contexts: storyboards and then short passages.



In *Wild Planet*, students identify the main idea and supporting details of paragraphs and then entire passages while participating as special guests in an intergalactic live-streamed travel show.



Texts become increasingly complex and require students to make inferences.

# The elements of a good story

Stories have a common structure—a main character, setting, problem, and solution.[1] Of course, many stories elaborate on that structure, but when students understand the common elements, they're able to comprehend any narrative better.[2,3] Explicit instruction in the basic structure improves story comprehension even at the kindergarten level,[4] allowing students to produce more complex stories of their own.[5] Games like *Story Box* and *Picture This* let them see and handle these elements, and use them to tell their own stories.

" Children who receive explicit instruction in narrative structures are able to transfer that knowledge to assist them in comprehension of novel stories, as well as to their overall reading comprehension skills."
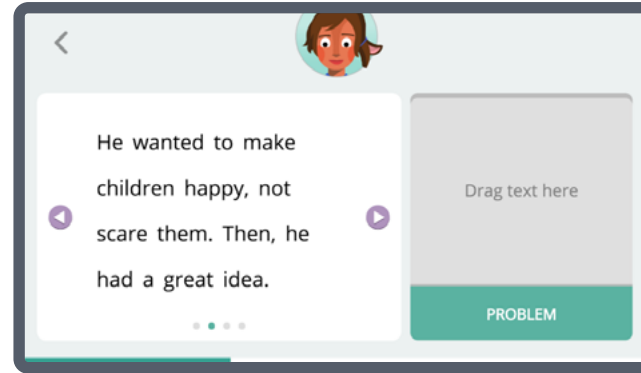
**Kelly Cartwright**
Christopher Newport University

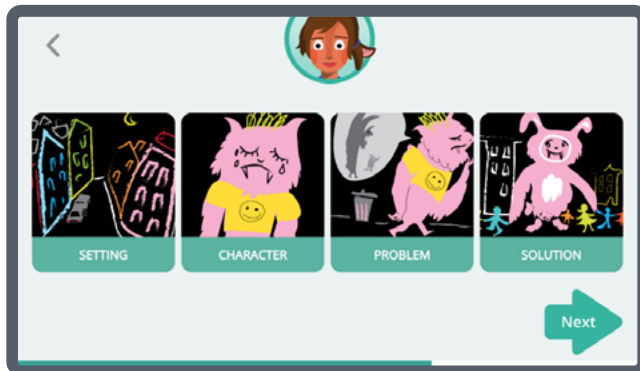| | |
|---|---|
| RL.1.1 | RL.2.3 |
| RL.2.1 | RL.3.5 |
| RL.K.3 | RL.4.5 |
| RL.1.3 | RL.5.5 |

1. Westby, C. E. (2011). Assessing and remediating text comprehension problems. In A. G. Camhi & H. W. Catts (Eds.), *Language and reading disabilities* (pp. 163–225). Boston: Pearson.
2. Stetter, M. E., & Hughes, M. T. (2010). Using story grammar to assist students with learning disabilities and reading difficulties improve their comprehension. *Education and Treatment of Children, 33*(1), 115–151.
3. Short, E. S., & Ryan, E. B. (1984). Metacognitive differences between skilled and less skilled readers: Remediating the deficits through story grammar and attribution training. *Journal of Educational Psychology, 76*(2), 225–235.
4. Stevens, R. J., Van Meter, P., & Warcholak, N. D. (2010). The effects of explicitly teaching story structure to primary grade children. *Journal of Literacy Research, 42*, 159–198.
5. Spiegel, D. L., & Fitzgerald, J. (1986). Improving reading comprehension through instruction about story parts. *The Reading Teacher, 39*(7), 676–682.
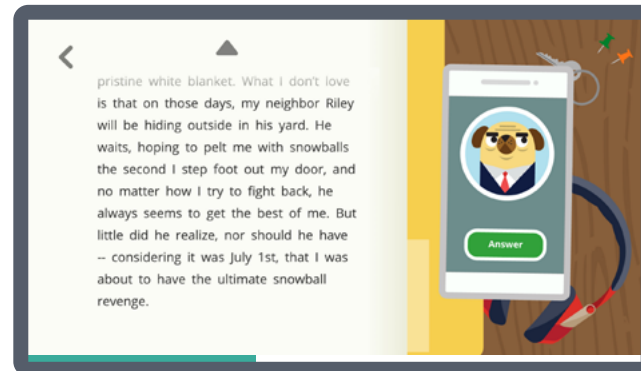
In *Story Box,* students build their own stories from a treasure chest of parts, learning the function of each element. When complete, their story comes to life.

Later, in *Picture This,* students collect story elements by selecting text in increasingly sophisticated narratives.

Students advance by paying attention to the words the author uses to set a problem, show how a character attempts to resolve it, and weave the plot together.

Finally, in *Newsflash*, students identify elements of increasingly complex texts from multiple points of view.

# Comparing texts

**Part of how** we make sense of the world is by comparing information, sorting it into categories, and connecting it to what we already know.[1] Standards call for students to be able to compare and contrast ideas and details from two texts on the same topic or stories in a series. Identifying similar ideas in different texts requires both good comprehension and critical analysis.[1] Our games *Book Club* and *City Planner* let students compare sets of informational or narrative texts. When they encounter the same situation in a state test, they will not be fazed.

| | | |
|---|---|---|
| RI.1.9 | RI.3.9 | RL.4.9 |
| RI.2.9 | RL.3.9 | RI.5.9 |
| RL.2.9 | RI.4.9 | RL.5.9 |

1. Dean, C. B., Hubbell, E. R., Pitler, H., & Stone, B. (2012). *Classroom instruction that works: Research-based strategies for increasing student achievement* (2nd ed.). Alexandria, VA: ASCD
2. Apthorp, H. S., Igel, C. & Dean, C. (2012). Using similarities and differences: A meta-analysis of its effect and emergent patterns. *School Science and Mathematics, 112*(4), 204–216.
3. Westby, C. E. (2011). Assessing and remediating text comprehension problems. In A. G. Camhi & H. W. Catts (Eds.), *Language and Reading Disabilities* (pp. 163–225). Boston: Pearson.
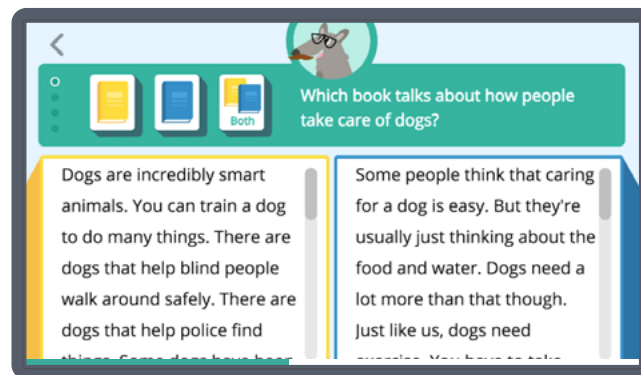
" When students are taught to compare informational texts, they are better able to learn new information across disciplines, including social studies, mathematics, and science.[2] And students benefit from practice comparing narrative texts to develop the metanarrative skills necessary to build an awareness of story structure and character perspectives. [3] "

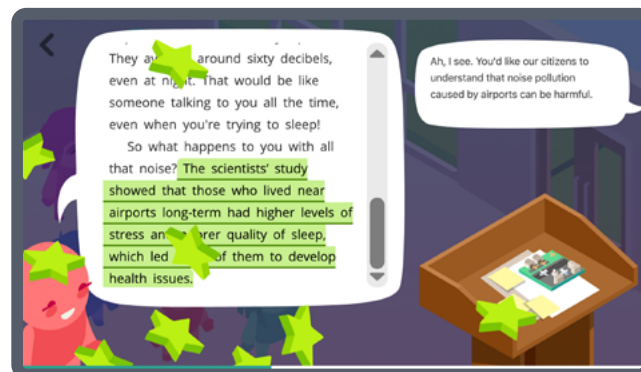**Elfrieda Hiebert**
President, TextProject

In *Book Club,* students are recruited by characters to recommend books. They practice critically analyzing two texts to identify which best addresses the character's need.



Students look for details related to common topics in informational texts. They search for details related to story elements and make inferences for narrative texts.



In *City Planner*, students must listen to different viewpoints (in text) from sometimes unruly town citizens about matters of town development (e.g., building an airport, creating a bird sanctuary).



They read two different texts, practice identifying the claim and evidence that supports the claim for each text, and must reach a decision on the topic that integrates the views and information shared by both characters.

# The age of reasoning

Determining how well an author supports an argument is an advanced skill. It's also critical across disciplines, especially in science, history, and literature.[1]  Students have to hold multiple ideas in working memory and consider how strongly they're connected. That takes practice,[2]  yet it's difficult for teachers to give every student sufficient opportunities to make and analyze arguments in class. We've dealt with that by creating *Debate-a-Ball*, a mock debate game where students get intensive modeling and practice with evaluating claims.
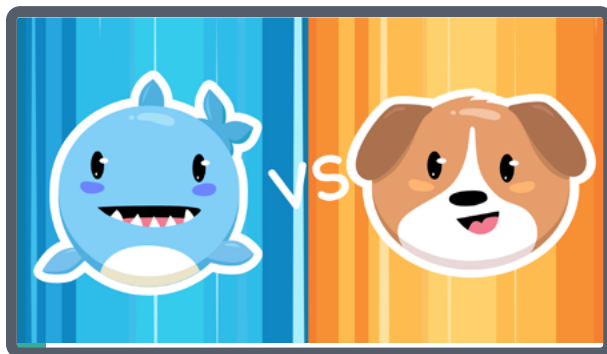
" Research has shown that students often lack sophistication in their argumentation skills and need explicit instruction and practice in how to give evidence to support claims when making or analyzing an argument. [1, 3, 4] "
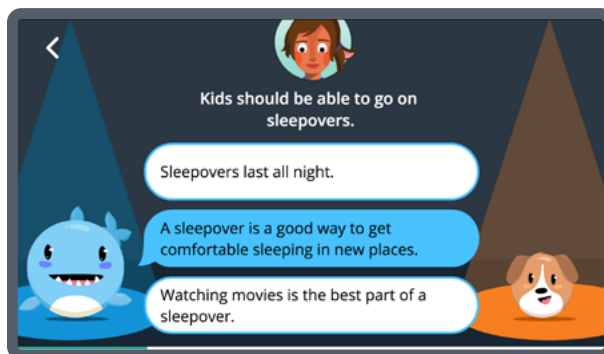
**Jennifer Zoski**
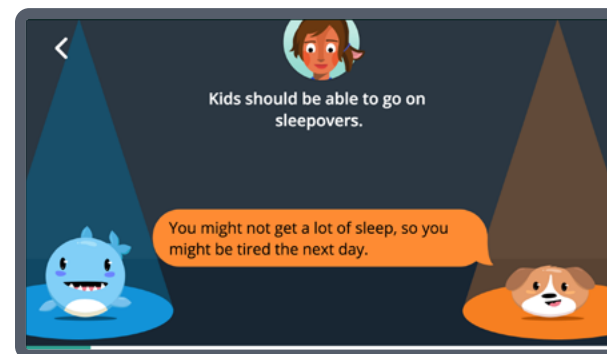Learning Scientist, Amplify

RI.2.8

1. Newell, G. E., Beach, R., Smith, J., & VanDerHeide, J. (2011). Teaching and learning argumentative reading and writing: A review of the research. *Reading Research Quarterly, 46*(3), 273–304.
2. Ross, D., Fisher, D., & Frey, N. (2009). The art of argumentation. *Science and Children*, 28–31.
3. Diakidoy, I. N., Ioannou, M. C., & Christodoulou, S. A. (2017). Reading argumentative texts: Comprehension and evaluation goals and outcomes. *Reading and Writing, 30*, 1869–1890.
4. Maloney, J., & Simon, S. (2006). Mapping children's discussions of evidence in science to assess collaboration and argumentation. *International Journal of Science Education, 28*(15), 1817–1841.

In *Debate-a-Ball,* students pick an animal avatar and go head-to-head with the computer to debate a familiar topic.



They are taught to identify the best evidence as that which is factual and strongly related to the claim.



To win, students must put forward the best evidence to support each claim more frequently than their opponent. Along the way, they get intensive practice in evaluating arguments.

" [Boost Reading is] helping me learn, it's helping me read, and it's helping me understand more and more...""

—3rd-grade student, Oklahoma

# Playing with poetry

There's a lot of good in teaching poetry to elementary students. When done with explicit instruction on poetic devices, it can help readers of all ability levels better understand the language and concepts presented in poems, recognize the value of poetry, and gain confidence in their reading ability.[1] In Boost Reading, students increase their comfort with the types of devices in the poet's toolkit as they guide a "poetic pixie" across lines and stanzas of a variety of poems in *Poet's Path.*
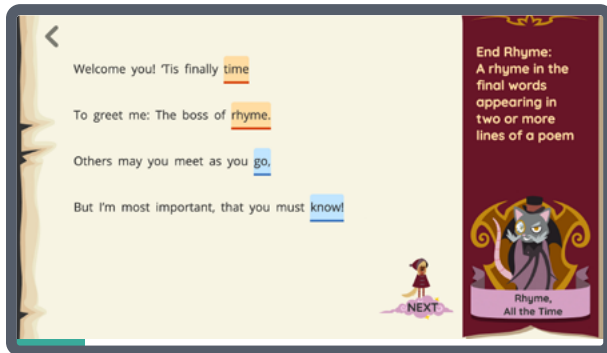
"Poet's Path uses clear and engaging activities to demystify poetry—a genre that many readers of all ages find unnecessarily intimidating. Through Poet's Path, students learn to identify and implement a range of literary devices, which equips them to become strong close readers of any text."
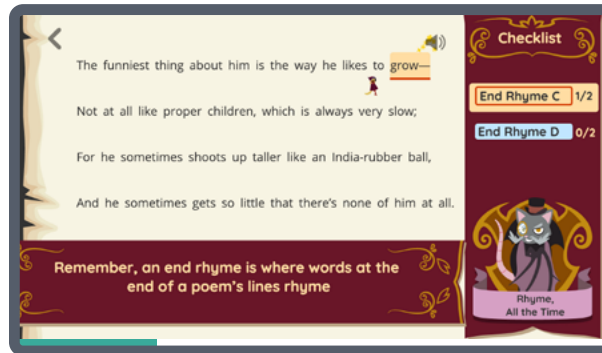
**Elizabeth Wade**
Managing Curriculum Developer, Amplify



Say it again, again

RL.4.5
RL.5.4
RL.5.5

1. Carver Sekeres, D. & Gregg, M. (2007). Poetry in third grade: Getting started. *The Reading Teacher, 60*(5), 466—475.
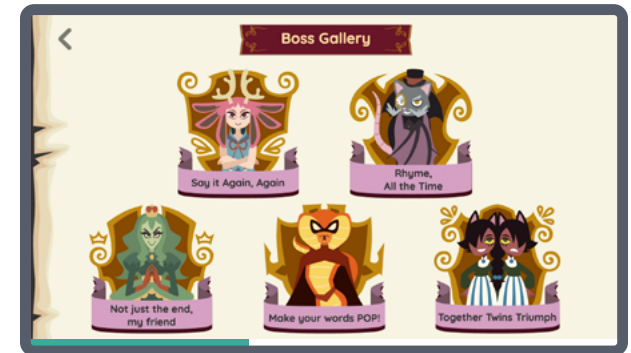
Traveling the *Poet's Path*, students will gain exposure to poetic forms and devices (e.g., end rhyme, internal rhyme, repetition, alliteration).



They see demonstrations of how poets choose words deliberately to convey meaning and a sense of rhythm and sound.



As students progress, characters within the game challenge them to complete poems by identifying words that both represent the correct usage of each device, and that convey the correct meaning.

**" I usually don't like to read poem books. But I like this. "**

—5th-grade student, Brooklyn

# Building semantic networks

To fully learn the meaning of a word, you have to use it in different contexts,[1] coming at it from different angles so that you create a semantic network around each word.[2–5] Boost Reading offers multiple opportunities for beginning and more accomplished readers to do exactly that. Pre-readers play *Sticker Book,* learning about word relationships by sorting related words into categories. Once they are readers, students encounter Tier 2 high-utility words[4] in *Word Raiders*, ultimately building a visual semantic map of each word.
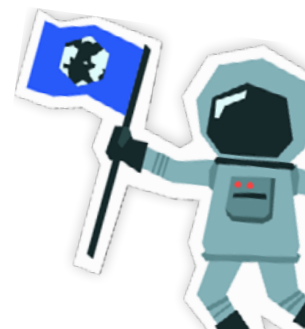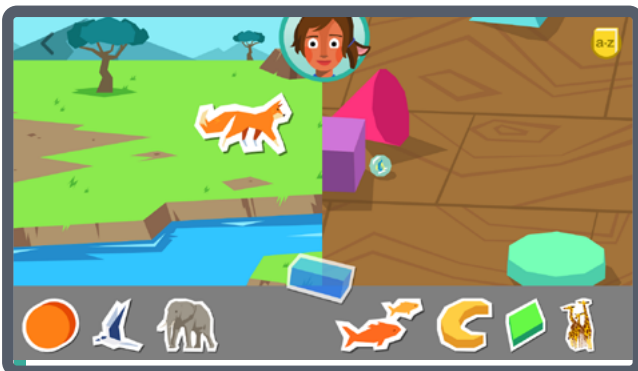
| | | | |
|---|---|---|---|
| L.2.5 | L.1.5.C | L.4.4 | L.5.4 |
| L.K.5.A | L.3.4 | L.4.4.A | L.5.4.A |
| L.2.5.A | L.3.4.A | L.4.5.C | L.5.5.C |
| L.1.5.A | L.3.6 | L.4.6 | L.5.6 |

" Extended vocabulary instruction across multiple contexts has been shown to increase students' skills in both vocabulary and comprehension. [2, 3, 6] Even at-risk students with weaker vocabularies experience substantial growth in vocabulary when deep knowledge is targeted, as compared to more shallow instruction, such as providing definitions within only one context. [3] "

**Jane Oakhill**
University of Sussex

1. Ouellette, G. P. (2006). What's meaning got to do with it: The role of vocabulary in word reading and reading comprehension. *Journal of Educational Psychology, 98*(3), 554–566.
2. Beck, I. L., Perfetti, C. A., McKeown, M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology, 74*(4), 506–521.
3. Coyne, M. D., McCoach, B., & Kapp, S. (2007). Vocabulary intervention for kindergarten students: Comparing extended instruction to embedded instruction and incidental exposure. *Learning Disabilities Quarterly, 30*, 74–88.
4. McKeown, M. G., Beck, I. L., & Sandora, S. (2012). Direct and rich vocabulary instruction needs to start early. In E. J. Kame'enui & J. F. Baumann (Eds.), *Vocabulary Instruction: Research to Practice.* New York: The Guilford Press.
5. Stahl, S. A., & Nagy, W. E. (2006). *Teaching Word Meanings.* Mahwah, NJ: Lawrence Erlbaum Associates.
6. Goldstein, H., Ziolkowski, R. A., Bojczyk, K. E., Marty, A., Schneider, N., Harping, J., & Haring, C. D. (2017). Academic vocabulary learning in first through third grade in low-income schools: Effects of automated supplemental instruction. *Journal of Speech, Language, and Hearing Research, 60*, 3237–3258.
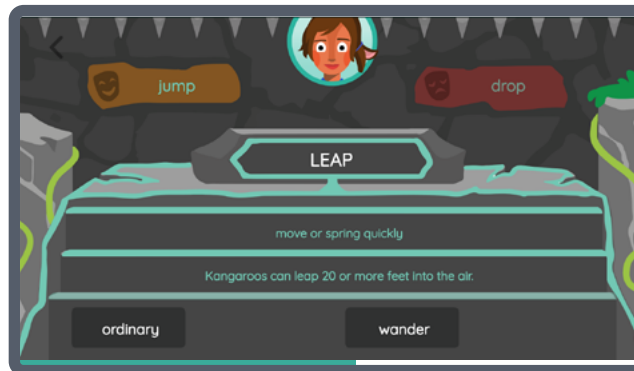
In *Sticker Book,* words turn into stickers when students sort them into the correct category, moving from easy (animals vs. instruments) to hard (parts of the body vs. parts of plants).



Older students complete a series of vocabulary tasks in order to solve puzzles and unlock doors in *Word Raiders.*



They match target vocabulary to synonyms and antonyms and then apply word knowledge by completing several sentences for each new word.



Finally, they reach the challenge room where they create a map of each word's semantic network to receive a bejeweled trophy.

# Focusing on high utility words

**Our program** focuses on high-utility curricular vocabulary likely to occur across disciplines—commonly referred to as Tier 2 vocabulary. These words are important because students are more likely to see them during their reading; they're often related to concepts students understand, and they're not typical in conversational language.[1] Building on their work in K–2, students in grades 3–5 will encounter these words in Boost Reading vocabulary practice, which uses synonyms and antonyms as well as words in context to help build students' deep word knowledge [1, 2] and teach students to recognize the context clues embedded in short passages that provide meaning-related information for unfamiliar words.[3]
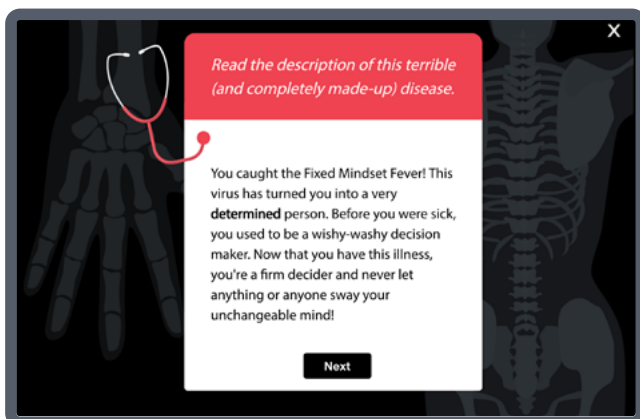
> " Extended vocabulary instruction across multiple contexts has been shown to increase students' skills in both vocabulary and comprehension. [2, 3, 6] Even at-risk students with weaker vocabularies experience substantial growth in vocabulary when deep knowledge is targeted, as compared to more shallow instruction, such as providing definitions within only one context. [3] "
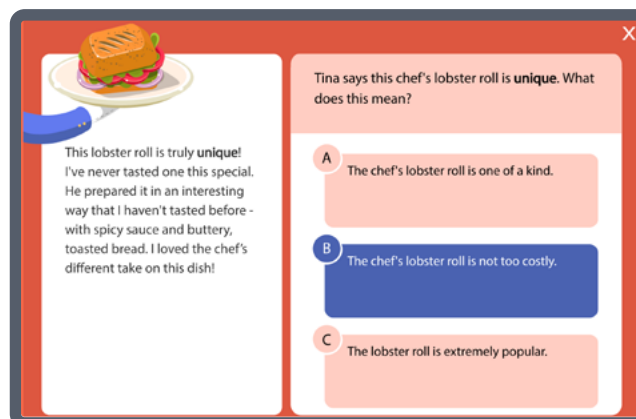
**Jane Oakhill**
University of Sussex

1. McKeown, M. G., Beck, I. L., & Sandora, S. (2012). Direct and rich vocabulary instruction needs to start early. In E. J. Kame'enui & J. F. Baumann (Eds.), *Vocabulary Instruction: Research to Practice.* New York: The Guilford Press.
2. Stahl, S. A., & Nagy, W. E. (2006). *Teaching Word Meanings.* Mahwah, NJ: Lawrence Erlbaum Associates.
3. Carnine, D., Kame'enui, E. J., Coyle, G. (1984). Utilization of contextual information in determining the meaning of unfamiliar words. *Reading Research Quarterly, 19*(2), 188–204.
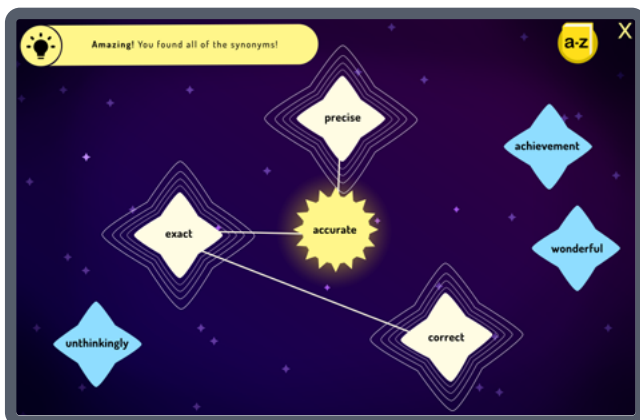
Students encounter each vocabulary word in a variety of contexts. They read words within short and engaging narratives, such as food blogs, lost diaries from a sunken ship, movie synopses, and amusing descriptions of invented medical diagnoses.



Each narrative includes embedded context clues to help students learn the meanings of target words. Students answer questions to demonstrate understanding and build word knowledge through context.



Students practice identifying synonyms and antonyms of these high-use words to grow the "network" surrounding these words, both to deepen their understanding of those target words and to broaden their knowledge of words with similar or divergent meanings.



When support is needed, students are provided with definition clues for the possible synonym and antonym choices.

# How to multiply vocabulary knowledge

**Many words** in English are formed with the help of prefixes and suffixes. So, if you know the meaning of "break," you can divine the meaning of "unbreakable" the first time you see it. This is called morphology, and a deep well of research shows that students who understand it as early as kindergarten [1,2] are stronger readers later on.[3] It's especially important for at-risk students and English learners.[4–6] By figuring out new words for themselves, students understand more as they read—a powerful virtuous circle which we reinforce in our game *Ink Blott.*

L.1.4.B     L.3.4.B
L.2.4.B     L.4.4.B     L.5.4.B

1. Apel, K., Wilson-Fowler, E. B., Brimo, D., & Perrin, N. A. (2012). Metalinguistic contributions to reading and spelling in second and third grade students. *Reading and Writing, 25,* 1283–1305.
2. Wolter, J. A., Wood, A., & D'zatko, K. W. (2009). The influence of morphological awareness on the literacy development of first grade children. *Language, Speech, and Hearing Services in Schools, 40,* 286–298.
3. Bowers, P., Kirby, J., Deacon, S. H. (2010). The effects of morphological instruction on literacy skills: A systematic review of the literature. *Review of Educational Research, 80,* 144–179.
4. Carlisle, J. F. (2010). Effects of instruction in morphological awareness on literacy achievement: An integrative review. *Reading Research Quarterly, 45*(4), 464–487.
5. Goodwin, A., & Ahn, S. (2013). A meta-analysis of morphological interventions in English: Effects on literacy outcomes for school-age children. *Scientific Studies of Reading, 17*(4), 257–285.
6. Reed, D. K. (2008). A synthesis of morphology interventions and effects on reading outcomes for students in grades K–12. *Learning Disabilities Research & Practice, 23,* 36–49.
7. Apel, K., & Diehm, E. (2013). Morphological awareness intervention with kindergarteners and first and second grade students from low SES homes: A small efficacy study. *Journal of Learning Disabilities, 47*(1), 65–75.
8. Zoski, J. L., & Erickson, K. A. (2017). Multicomponent linguistic awareness intervention for at-risk kindergarteners. *Communication Disorders Quarterly, 38*(3), 161–171.

" When students are provided with morphological awareness training in the early grades, they make gains in word reading, spelling, reading comprehension, and vocabulary.[3–8] Ink Blott was designed to help children build that awareness and an inventory of morphemes— the multipliers of vocabulary knowledge. "

**Jennifer Zoski**
Learning Scientist, Amplify

*Ink Blott* must repair an underground world by tunneling through dirt and fixing broken sentences using morphology skills.



First, students mine a morpheme by splitting an affix from a root word, modeling the strategy for decoding unfamiliar words.



They use their collected morphemes (called "word parts" in the game) to complete sentences and progress through tunnels.



Students have to collect several morphemes and apply them correctly to clear a cavern and move to the next level of the game.

# Deep vocabulary

**Researchers** have shown that having a deep vocabulary is as important for comprehension as how many words you know. [1, 2] Just teaching definitions is not enough. Students need to explore relationships among words across multiple contexts[3–5] —for instance, by organizing related words by semantic gradients, as in the game *Shades of Meaning*. In this game, students build on what they already know and get to see these relationships graphically.[6]

**L.2.5.B**
**L.1.5.D**
**L.3.5.C**

> " Poor comprehenders have difficulty accessing deep vocabulary knowledge including word relationships and categories.[7] Shades of Meaning helps them see subtle differences in meaning and learn new words based on words they already know."
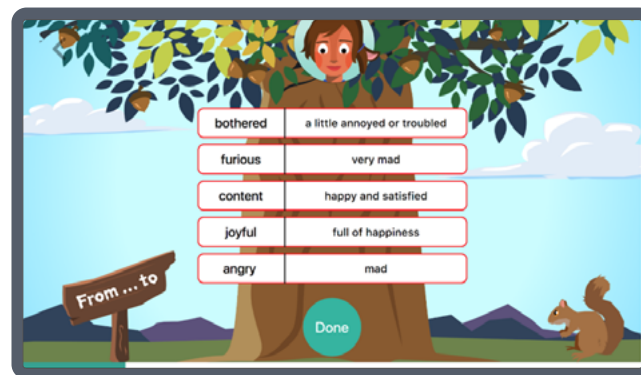
**Jane Oakhill**
University of Sussex

1. Oakhill, J., Cain, K., & Elbro, C. (2015). Knowing and learning the meaning of words. In *Understanding and teaching reading comprehension: A handbook* (pp. 54–68). New York: Routledge.
2. Ouellette, G. P. (2006). What's meaning got to do with it: The role of vocabulary in word reading and reading comprehension. *Journal of Educational Psychology, 98*(3), 554–566.
3. Beck, I. L., Perfetti, C. A., McKeown, M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology, 74*(4), 506–521.
4. Coyne, M. D., McCoach, B., & Kapp, S. (2007). Vocabulary intervention for kindergarten students: Comparing extended instruction to embedded instruction and incidental exposure. *Learning Disabilities Quarterly, 30,* 74–88.
5. McKeown, M. G., Beck, I. L., & Sandora, S. (2012). Direct and rich vocabulary instruction needs to start early. In E. J. Kame'enui & J. F. Baumann (Eds.), *Vocabulary Instruction: Research to Practice.* New York: The Guilford Press.
6. Blachowicz, C. & Fisher, P. J. (2015). Learning vocabulary in the content areas. In *Teaching Vocabulary in All Classrooms.* Boston: Pearson.
7. Oakhill, J., Cain, K., & McCarthy, D. (2015). Inference processing in children: The contributions of depth and breadth of vocabulary knowledge. In *Inferences During Reading* (pp. 140–159). Cambridge University Press, Cambridge
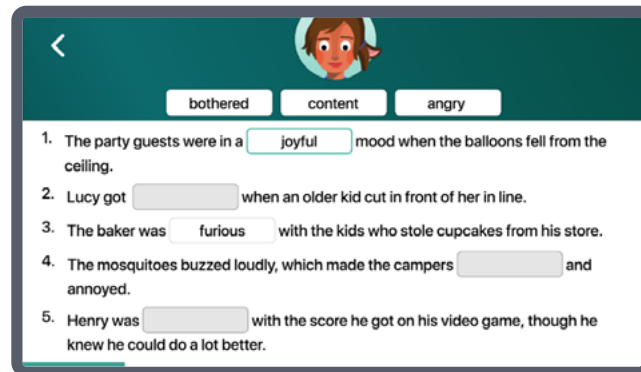
In *Shades of Meaning,* students arrange words about, for example, feeling mad, from least to most.



When students need support, the program adapts by flipping over words to reveal a definition clue.



If further support is needed, students are shown a visual sequence illustrating how the words are similar but different.



Then students fit each word into a sentence crafted to allow them to generalize shades of meaning in context.

# Using jokes and idioms to teach

**Why can't** *the leopard escape the zoo? He keeps getting spotted! T*he reason we laugh (or wince) at that joke is because we know when to use a word's alternate or figurative meanings. Researcher Nicola Yuill has found that jokes that highlight a word's multiple meanings help beginning readers with the meta-linguistic skill of activating these meanings, and improve comprehension.[1] Students also benefit from the direct teaching of idioms, especially when shown with supportive narrative context.[2, 3] Games like *Punchline!* and *Idiomatica* ensure plenty of practice in these areas.

> "Readers who can think flexibly about word and sentence meanings are better able to use context to monitor their comprehension for meaning.[4,5] *Punchline!* gives them lots of opportunities to do that."
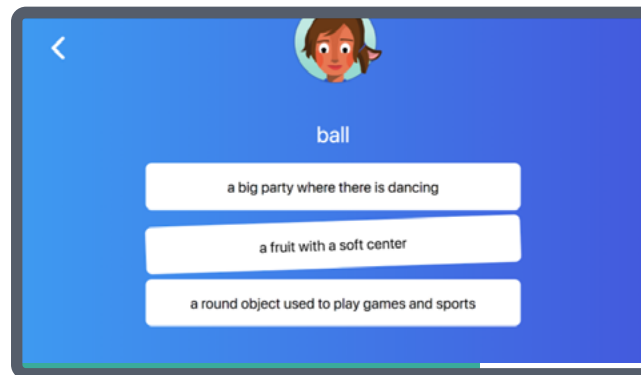
**Nicola Yuill**
University of Sussex

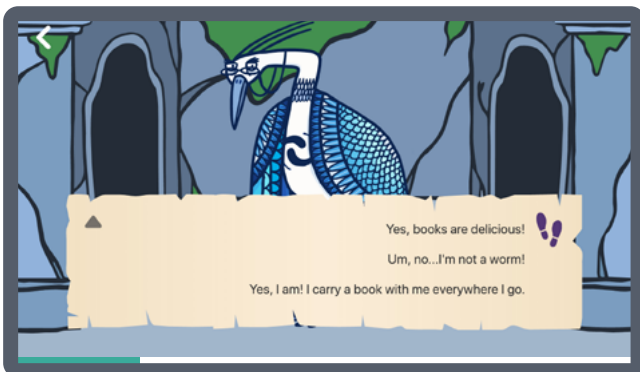| | |
|---|---|
| L2.4 | L.3.5.A |
| L.2.4A | L.4.5.B |
| L.3.4.A | L.5.5.B |

1. Yuill, N. (2009). The relation between ambiguity understanding and metalinguistic discussion of joking riddles in good and poor comprehenders: Potential for intervention and possible processes of change. *First Language, 29*(1), 65–79.
2. Cain, K., Oakhill, J., & Lemmon, K. (2005). The relation between children's reading comprehension level and their comprehension of idioms. *Journal of Experimental Child Psychology, 90*, 65–87.
3. McPherron, P. & Randolph, P. T. (2014). *Cat Got Your Tongue? Recent Research and Classroom Practices for Teaching Idioms to English Learners Around the World.* Alexandria, VA: TESOL Press.
4. Zipke, M. (2008). Teaching metalinguistic awareness and reading comprehension with riddles. *The Reading Teacher, 62*(2), 128–137.
5. Zipke, M., Ehri, L. C., & Smith Cairns, H. (2009). Using semantic ambiguity training to improve third graders' metalinguistic awareness and reading comprehension: An experimental study. *Reading Research Quarterly, 44*(3), 300–321.
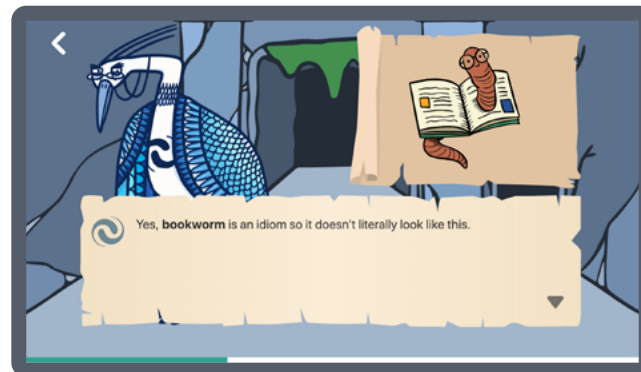
In *Punchline!,* students figure out the correct punchline for a joke, based on a word with multiple meanings.



Then they identify the ambiguous word and its two meanings, reinforcing the concept of multiple meanings and the definitions of important vocabulary words.



In *Idiomatica*, students answer riddles to show that they understand the figurative meanings of phrases.



They state the definitions of the idioms and apply their knowledge by using the phrase meaningfully within the context of a conversation.

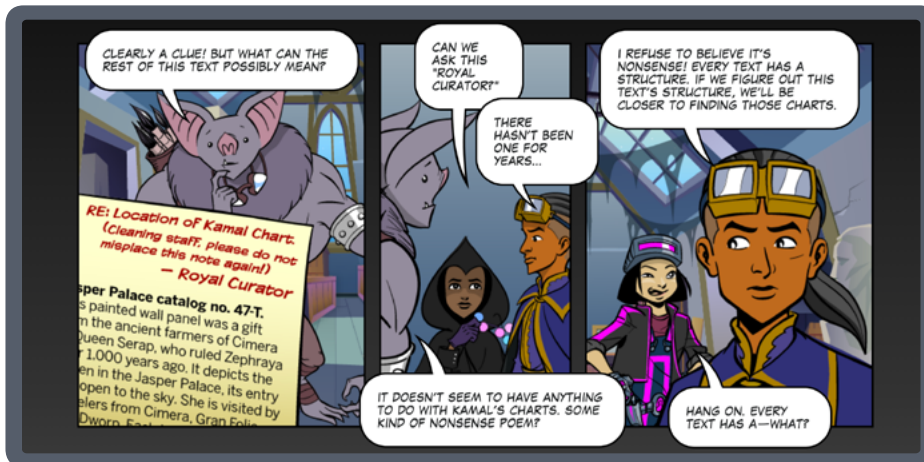# Engaging in higher-order skills with complex texts

**Becoming a reader** is learning to engage with the wealth of rich, complex texts in the world. That's why it's so important to know how to read closely. As well as being key to college and career readiness, close reading instruction is linked to gains in reading proficiency and self-perceptions around reading, especially for struggling readers.[1, 2] In 4th and 5th grade, Boost Reading builds these skills using high-quality texts, carefully crafted questions, and technology-enhanced items like you'd find in high-stakes assessments—all wrapped up in a compelling, interactive graphic novel experience.

"In Boost Reading, students are immersed in a compelling and powerful narrative, an approach shown to increase student interest, self-efficacy, and feelings of involvement and control in their learning.[3]"

**Jenna Marks**
Senior Learning Scientist, Amplify

| RL 4.3 | RI 4.5 | RL 5.2 | RI 5.5 |
| RL 4.4 | RI 4.8 | RL 5.3 | RI 5.8 |

1. Partnership for Assessment of Readiness for College and Careers. (2010). *The Partnership for Assessment of Readiness for College and Careers (PARCC) application for the Race to the Top comprehensive assessment systems competition.* Washington, DC.
2. Fisher, D., & Frey, N. (2014). Close reading as an intervention for struggling middle school readers. *Journal of Adolescent & Adult Literacy, 57,* 367–376.
3. Mcquiggan, S. W., Rowe, J. P., Lee, S., & Lester, J. C. (2008, June). Story-based learning: The impact of narrative on learning experiences and outcomes. In *International Conference on Intelligent Tutoring Systems* (pp. 530–539). Springer, Berlin, Heidelberg.
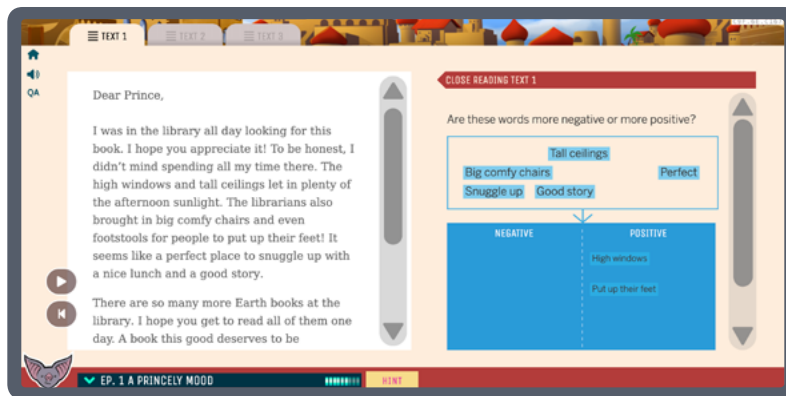
All instruction takes place within the fantasy-infused graphic novel adventure of *The Four Eyes* (TFE). It's up to each student to master close reading skills in order to achieve the legendary four Great Tasks.



The narrative embedded throughout the episodes reinforces the concepts students are learning (in this case, simile).

> " I usually don't like reading a lot but this was fun and exciting, how it was able to teach me more than I already know. Some things I read in school, it's hard to read or...some chapter books are long and this surprised me...I didn't expect it to be this fun... "

—5th-grade student, Brooklyn

# Key close reading topics



Students learn how positive and negative word choice affects the mood of a text.



Students recognize similarities in a compare-and-contrast text structure.

## Author's Craft

In this lesson set, students are introduced to some of the tools of author's craft—figurative language, mood, tone, symbolism, and theme. They're taught not just to recognize these techniques, but also to think about their effects on the text and the way they shape the relationship between reader and writer.[1] By understanding author's craft, students learn to "read like writers," which ultimately leads to improvements in their own writing.[2]

## Text Structure

These lessons introduce students to some of the most common informational text structures—problem and solution, sequence, cause and effect, and comparing and contrasting. Students use these structures to comprehend and learn from complex informational texts.[3] Through understanding these structures, students learn to recognize the relationships among different pieces of information and improve their ability to find key ideas in text.[4]
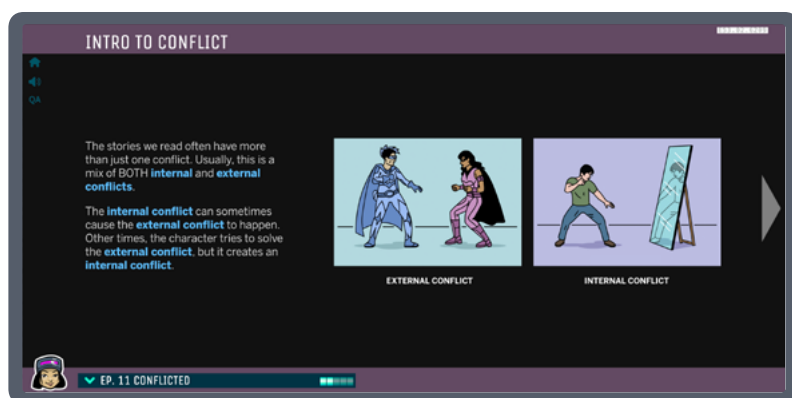
1. Story, K., & Sneddon, M. (2008). Teach them how: analysing author's craft in middle years literacy classrooms. *Practically Primary, 13*(1), 40–45.
2. Griffith, R. R. (2010). Students learn to read like writers: A framework for teachers of writing. *Reading Horizons, 50*(1), 5.
3. RAND Reading Study Group. (2002). Reading for understanding: Toward an R&D program in reading comprehension.
4. Cain, K., Oakhill, J., & Elbro, C. (2014). *Understanding and teaching reading comprehension: A handbook.* Routledge.
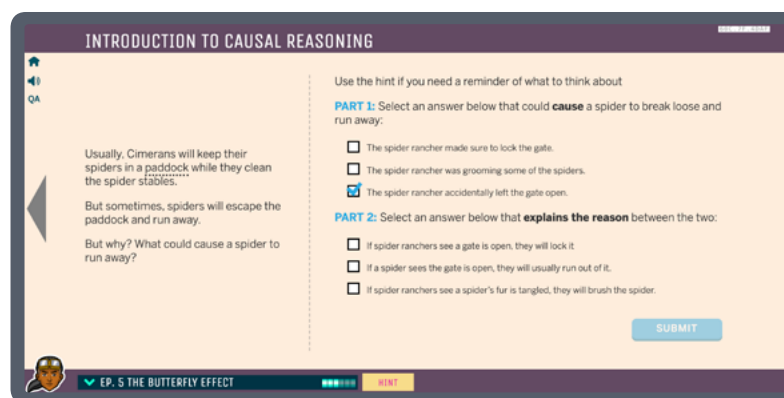5. Lynch, J. S., & van den Broek, P. (2007). Understanding the glue of narrative structure: Children's on-and off-line inferences about characters' goals. *Cognitive Development, 22*(3), 323–340.

Illustrations aid students in understanding complex topics, like internal vs. external conflict.



Students answer the same types of items they might see on standardized tests as they dissect an argument in a text.

## Characterization

To understand any work of fiction, it's crucial to know its characters—what they want, how they think, what they believe[5]—yet preadolescent readers often find it hard to recognize these elements in narrative.[6,7] We teach characterization by examining the dynamics between character and plot—how character traits, motivations, and points of view lead to conflict; how this becomes the driver of plot; and the eventual changes characters undergo.

## Argumentation

In order to engage the world critically, it's crucial for students to know how to identify the arguments they hear, break down their parts, and see how those parts work to be persuasive. It's a critical skill for students' academic success,[8–10] as well as their civic engagement.[11] With this set of lessons, we focus in on the way authors construct their arguments, and how to evaluate arguments on the basis of their strength and completeness.

6.  Emery, D. W. (1996). Helping readers comprehend stories from the characters' perspectives. *The Reading Teacher, 49*(7), 534–541.
7.  Shannon, P., Kameenui, E. J., & Baumann, J. F. (1988). An investigation of children's ability to comprehend character motives. *American Educational Research Journal, 25*(3), 441–462.
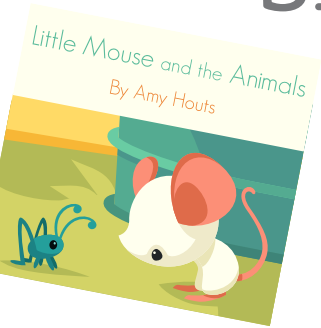8.  Hillocks, G. (2010). " EJ" in focus: Teaching argument for critical thinking and writing: An introduction. *The English Journal, 99*(6), 24–32.
9.  Kuhn, D. (2005). *Education for thinking*. Harvard University Press.
10. Newell, G. E., Beach, R., Smith, J., & VanDerHeide, J. (2011). Teaching and learning argumentative reading and writing: A review of research. *Reading Research Quarterly, 46*(3), 273–304.
11. Flower, L. (2008). Community literacy and the rhetoric of public engagement. SIU Press.

# Transferring hard-won skills to rich texts

Students of Boost Reading use digital texts that adapt to their needs via an adaptive algorithm that unlocks each book at the exact right point in a reader's development. To ensure that students are practicing their hard-won skills, we integrated interactions from familiar games like *Unmask That* and *Connect It* right into our digital texts to allow students to move seamlessly from text-embedded-in-games to games-embedded-in-text, maximizing their transfer of skills to connected text and their sense of growing competency.

In grades K–3, students read books where they can practice the decoding and comprehension skills they've been learning. In grades 4 and 5, the program shifts focus to have students apply their skills (like those in their comprehension and close reading activities) to complex grade-level texts.
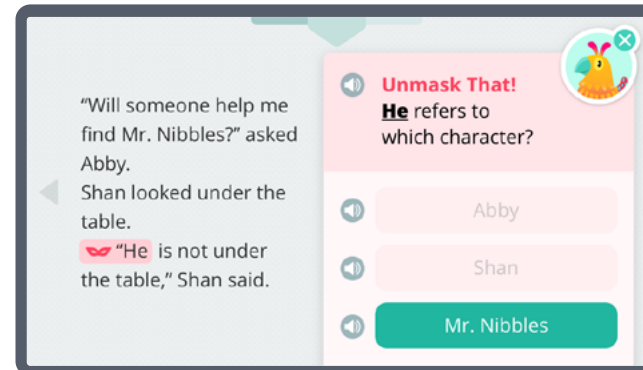
All of our books include a variety of supports, such as Reveal words (definitions for grade-level vocabulary words), Read Alouds, and word highlighting, so that all students—regardless of reading level—can access and learn from them.
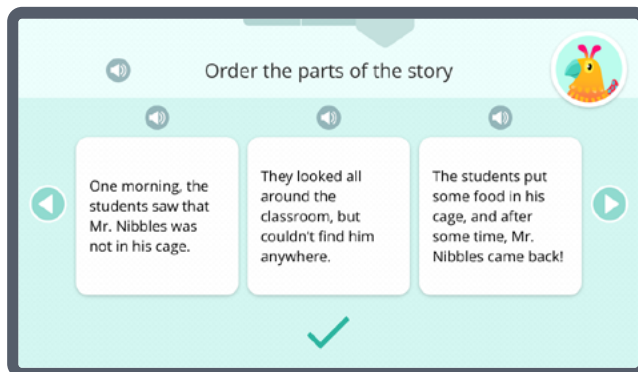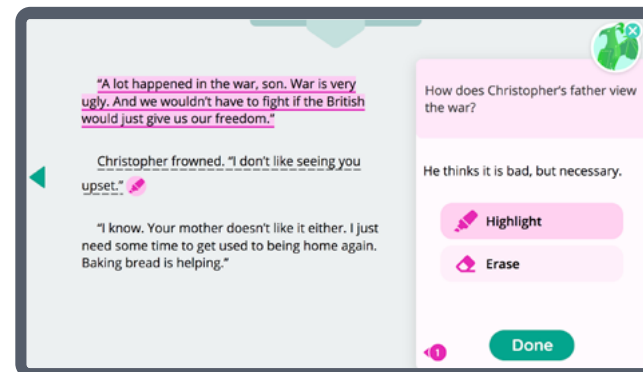
When readers first unlock a new book—tuned to their level—they read through without interruption (with Read Aloud support if appropriate).



In a second read, students discover embedded activities that repeat the familiar iconography of a game they previously mastered.



At the end of the book, additional activities evaluate students' comprehension.



In grades 3–5, students experience chapter books and a new type of question. They answer multiple choice questions and must tag evidence to support their inferences.

# Comprehensive system in action

Amplify's early literacy suite is a family of programs that are all built on the Science of Reading and connect with one another.

**What makes Amplify's early literacy suite powerful?**

1. It is a cohesive literacy solution to support MTSS and RTI.

2. Aligned resources do away with the need for piecemealing.

3. Data drives next steps for whole group, small group, and individual students.

TIER  1  2  3

**Assess: mCLASS**

- Universal and dyslexia screening
- Targeted, teacher-led instruction
- Ongoing progress monitoring
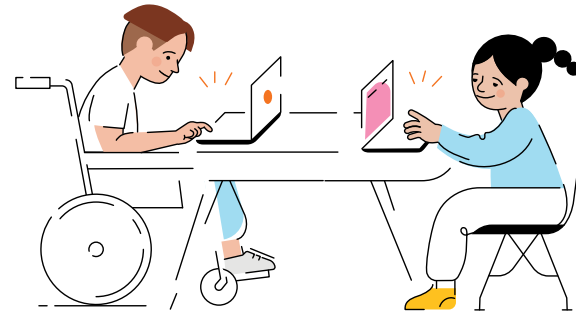
Data is used to inform instructional needs

All students placed into personalized learning

Students at risk are placed into intervention

TIER **1** 2 3

## Instruct: Amplify CKLA

- Builds strong foundational skills
- Develops background knowledge and vocabulary
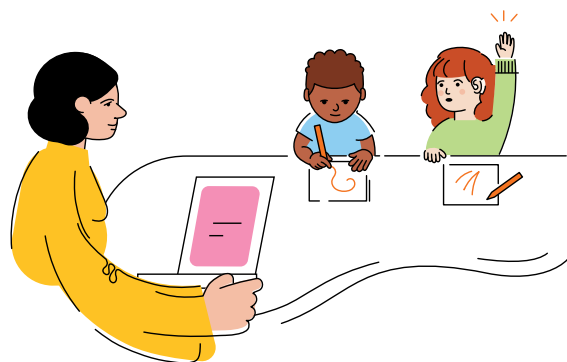- Boosts engagement with rich and diverse content

TIER 1 **2** **3**

## Practice: Boost Reading

- Personalized remediation and enrichment makes learning to read fun
- mCLASS data informs student placement
- Differentiated practice reinforces and strengthens Amplify CKLA instruction

TIER 1 **2** **3**

## Intervene: mCLASS Intervention

- Targeted, staff-led intervention
- Places students into small groups seamlessly using mCLASS data
- Can be delivered by classroom teachers, interventionists, tutors or paraprofessionals

# A product built for these times

While COVID has had a huge impact on students' literacy instruction, with the biggest concern around early readers, Boost Reading delivers a literacy solution uniquely built to reduce the stress of teaching during this pandemic. We're here to support you and your students, no matter what your learning environment looks like.

" [Boost Reading] has taken a weight off my shoulders and I am so grateful and can't thank you enough! My biggest concern during this time was how can I keep pushing my readers at their level—and giving them what they need— and Boost Reading solved that. "

—2nd-grade teacher, Chicago, IL

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Science
OF
Reading

For more information on Boost Reading
contact your Amplify representative today:
**(800) 823-1969** or visit **amplify.com/reading**

Amplify.