Using Technology to Support Reading Comprehension

Reading Comprehension – the Goal of Reading Instruction

- Comprehension is the essence of reading
- Comprehension strategies should be present in everyday teaching across the curriculum
- As a strategic process, it enables readers to make connections and move beyond literal recall
- Needs to be taught explicitly and strategically
- Knowing students’ reading abilities is essential for teachers

Levels of Comprehension

- Online: Literal
  - Explicitly stated main ideas, details, sequences
- Between the Lines: Inferential Comprehension
  - Ideas the author shares through descriptive language - can’t point to the answer
- Beyond the Lines: Evaluative Comprehension
  - Identify bias, make judgments, draw conclusions, summarize, predict outcomes

Developmental Stages/Levels of Reading

Emergent Stage
- Begin to make correlations among oral, written, and printed stimuli
- Enjoy listening to stories
- Understand that print conveys a message
- Acquiring ability to apply concepts about print
- Understanding of direct link of the sounds to letters, pictures to words, and speech to sentences
- Repetitive use of language and illustrations help with the contextual meaning of written words
- Logographic/environmental information assists emergent readers in meaning of words
- Benefit from short and simple text

Early Stage
- Mastered emergent reading behaviors
- Comfortable with the basic concepts about print
- Reading and writing stories at a higher level of complexity
- Begin to discuss what they are reading with others
- Less dependent on rhyme, repetition, and patterns within text.
- Variations in sentence length and language are common
- Sentences include high-frequency words that they read automatically
- Their eyes control the reading so not as much pointing to words
- The text contains simple concepts and story lines and relate to real-world experiences

Transitional
- Able to make sense of longer and more complex books
- Easily adapt strategies to support reading for meaning
- Efficiently self-correct to maintain the contextual intent
- Beginning to use semantic – meaning, syntactic – structure and grammar and visual to self-monitor
- Need relevancy of textual situations to build vocabulary
- Plot, character, setting and dialogue and fluency
- Begin verbal expressions as they read
- Appropriate texts have more complex language structures and less emphasis on patterned text.
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Fluent Stage
- Heavy reliance on the text – less reliance on the illustrations
- Illustrations are now only of limited support
- Comfortably read independently for extended periods
- Recognize many words by sight
- Reading happens with automaticity
- Adjust their pacing based upon the purpose and difficulty of text
- Have a variety of strategies for decoding unknown words
- Comprehension is occurring at a sophisticated level (i.e., synthesizing, and interpreting
- Familiar with complex sentence structures, story concepts and literary genres.

Teachers need to decide:
- Which strategies, techniques, teacher talk.
- What resources will best support the students and move them into the next stage.

Barriers to Reading Comprehension
- Reading strategies are complex and difficult to include into direct instruction
- Teachers inadequately trained or prepared for the teaching of comprehension strategies
- Large classrooms – not enough time to allow for intensive strategy instruction one-on-one
- Lack of additional resources to meet the varying needs of the classroom.

Students with learning Disability may present difficulties in: (Joan Sedita)
- Word recognition/decoding skills
- Fluency
- Language processing/ linguistic ability
- Vocabulary
- Life experience /background knowledge
- Attention
- Memory
- Meta-comprehension & application of strategies
- Expressive language weakness
- Visualizing & creating mental images

<table>
<thead>
<tr>
<th>Textbooks</th>
<th>Narrative Text</th>
<th>Expository Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Alice in Wonderland”</td>
<td>Beginning, middle, and end</td>
<td>Science</td>
</tr>
<tr>
<td></td>
<td>Plot</td>
<td>Listing</td>
</tr>
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<td></td>
<td>Characters</td>
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<td></td>
<td>Structures</td>
<td>Compare/contrast</td>
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<td>setting</td>
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<td>Social Studies</td>
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<td>Problem/solutions</td>
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<td></td>
<td></td>
<td>Compare/contrast</td>
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<td>Time ordering</td>
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</tbody>
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- Pressley’s (1998) study of grade 4 and 5 classrooms indicated that there was very little instruction in the area of comprehension going on.
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Reading Comprehension Interventions & Strategies
Observing students provides “information needed to design sound instruction” (Clay, 2002, p.11).

Steps to Improving Comprehension
1. Identify where difficulty occurs
2. Identify what the difficulty is
3. Restate the difficult sentence or passage in their own words
4. Look back through the text
5. Look forward in the text for information that might help them to resolve the difficulty.
6. Students should monitor their own comprehension
   a. be aware of what they do understand
   b. identify what they do not understand
   c. use appropriate "fix-up" strategies to resolve problems in comprehension
7. Using graphic and semantic organizers
8. Answering questions
9. Generating questions
10. Recognizing story structure (Setting, initiating events, internal reactions, goals, attempts, outcomes)
11. Summarizing
   o identify or generate main ideas
   o connect the main or central ideas
   o eliminate redundant and unnecessary information
   o remember what they read

Cognitive Strategies are
• Conscious thought or behavior used by a reader to process text.
• Enhance and enlarge the scope of learning
• When teachers are teaching readers how and when to use it independently, confidently, and strategically

Cognitive Strategies are not
• Instructional Activities
• Study Skills
• Reading Skills

4 Strategies that Good Readers Use to Construct Meaning from Text
   Summarizing – encourages students to synthesize and explain important information from the text in their own words.
   Question generating – requires students to identify information from the text that is central enough to warrant a question.
   Clarifying – brings students attention to the various reasons why the text may be difficult for them to understand, and assists them in resolving those situations.
   Predicting – helps students analyze the content of the text and hypothesize what might happen next.

3 Additional Reading Comprehension Strategies (CAST – Center for Applied Special Technology added these 3 when developing Thinking Reader Series)
   Visualizing – asks the students to imagine what a character or setting looks like.
   Feeling – encourages students to relate personally to the story.
   Reflecting – requires that students think back on their own work and responses throughout the text and evaluate how they are progressing as a reader.
### Using Technology to Support Reading Comprehension

#### Strategies & Reading Comprehension

<table>
<thead>
<tr>
<th>Before Reading = Preparation and Organization for Pre-Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Set a purpose for reading</td>
</tr>
<tr>
<td>- Build Background Knowledge</td>
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<tr>
<td>- Recognition and formulation of main idea at paragraph level and multi-paragraph level</td>
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<tr>
<td>- Predict and check</td>
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<td>- Vocabulary Preview</td>
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<tr>
<th>During Reading = Synthesizing &amp; Monitoring while Reading</th>
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<tr>
<td>- Echo &amp; Choral Reading</td>
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<tr>
<td>- Answer pre-reading questions</td>
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<tr>
<td>- Story Mapping</td>
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<tr>
<td>- Predict Ahead</td>
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<tr>
<td>- Outlining</td>
</tr>
<tr>
<td>- Highlighting stated main idea</td>
</tr>
<tr>
<td>- Paraphrase inferred main idea</td>
</tr>
<tr>
<td>- Highlighting supportive main idea</td>
</tr>
<tr>
<td>- Create Pictures of Settings, characters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>After Reading = Reviewing and Summarizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Review – Highlights, Bookmarks, Notes</td>
</tr>
<tr>
<td>- Character Dramatizations</td>
</tr>
<tr>
<td>- Reflection</td>
</tr>
<tr>
<td>- Fortune Teller Question Review</td>
</tr>
<tr>
<td>- Responding</td>
</tr>
<tr>
<td>- Summarizing and paraphrasing</td>
</tr>
<tr>
<td>- Synthesizing and summarizing</td>
</tr>
</tbody>
</table>

#### Technology & Reading Comprehension

**Spinners** – Set purpose questions, background knowledge, build interest

**Timers** - Track time on reading task, Mark breaks ahead, Preset reading intervals
- Watch Timers, Watch Minder, Bookmark Timers

**Hand Held Tools** – Homonyms, Dictionary, Thesaurus, Auditory Feedback, Wordlist, Games/Exercises
- Franklin Speller, Thesaurus, Talking Dictionary

**Audio Tools** – Return to key sections, reread from counters, listen to self-reading out loud for fluency practice
- Hand-held speak-listen tools, Digital Recorders, Tape Players, Record Features in E-Readers

**Images & Video** – Build Background Knowledge & Curiosity, Storyboard, Scripting
- Cameras
- Digital Video
- Clips from Internet
- DVD Movies – Incite!

**Electronic Reading Systems (E-Readers, Scan&Read Systems)** - Skim Headings, Turn headings into pre-reading questions, Talking Text, Dictionaries, Synonyms, Thesaurus, Summarize through voice/text notes, answer built-in questions, bookmark sections, highlight main ideas or sections for further research, review notes and summaries
- Aspire Reader
- Dolphin Tutor
- GH Player
- Kurzweil 3000
- Read & Write Gold
- Read:OutLoud
- Scan & Read Pro
- Universal Reader
- WYNN:What You Need Now
Using Technology to Support Reading Comprehension

INSERT

☒ Helps readers to become more aware of a breakdown in comprehension
☒ Clairfy Later
☒ Marking system for INSERT
☐ X I thought differently
☐ + New Information
☐ ! Wow
☐ ?? I don’t understand
☒ * Very Important

Highlighting – New Vocabulary, Mark Main Ideas ahead of time, Extract highlights from main text
☐ Post-It Notes
☐ Post-It Tape
☐ Hi-Liter Pens
☐ Highlighter Tape, Tabs, Wide Tape
☐ Electronic Highlighting

Bookmarking – mark main sections, breaks in reading time
☐ Flags, Colored Tabs, Rubber Stamps, Mailing Labels

Graphic Organizers - KWL, Story Mapping, Mesh new ideas with old ideas, Character Webs, Concept Maps, C-SPACE, KWL-Notes, Prediction Check in, Episode Mapping, Timeline, Map whole to parts and parts to whole, emphasize main idea, aid discussion, memory flash card reviews, Venn Diagrams
☐ Amazing Writing Machine
☐ Creative Writing Workshop
☐ Draft Builder
☐ Inspiration
☐ Kidspiration
☐ OmniGraffle, OmniOutline
☐ Smart Ideas
☐ Spark Space
☐ Thought Manager
☐ Writer’s Companion

Multimedia systems - Picture settings, Recreate characters, Create review games, Make fortune tellers

Internet & other Reference CDs - research, questions explored, further background development
☐ American Heritage Electronic Dictionary
☐ Grolier Multimedia Encyclopedia
☐ The Way Things Work
☐ The Ultimate Human Body
☐ Cartopedia
☐ Street Atlas

Final Notes

Components of Effective Programs (R. Allington, 1998, Teaching Struggling Readers)
• Organization for Early Intervention
• Amount of Instructional Time
• Length of Intervention
• Types of Texts and Materials Used
• Text-Level Strategies
• Word-Level Strategies
• Writing Component
• Assessment procedure
• Home Connection
• Teacher Training

Steps for Scaffolding Any Comprehension Strategy
1. Introduce
2. Modeling
3. Guide the Strategy in Cooperative Groups or Pairs
4. Independent Practice
5. Reflection
Comprehension is viewed as the “essence of reading” (Durkin, 1993)

Michael Pressley’s (1992) research found comprehension improvement when students approach the text strategically and utilize a small set of comprehension strategies.

Students who learn to use the internal organization and structure of information text are more able to comprehend and retain key ideas.

Becoming a Nation of Readers (Anderson, Hiebert, Scott, & Wilkinson, 1985) stated, “Reading is a process in which information from the text and the knowledge possessed by the reader act together to produce meaning” (p.8).” (Cathy Block, 1993, Donald Graves, 1985)

“The 2003 National Assessment of Educational Progress (NAEP) found that in the eighth grade, 31% of boys and 21% of girls could not read at the basic literacy level” stated Calhoon, M.B, 2005, p.424.

Good readers are making sense of the text and they use strategies when they know they have problems with understanding (Armbruster, Lehr, & Osborn, 2003).

Durkin, 1979, observed that only 28 minutes (0.63%) out of 4,469 minutes of reading instruction were spent on comprehension strategies (Durkin, 1979). That trend continues today, as students enroll in the higher grades, less time is spent on teaching reading comprehension strategies (Pressley, 1998).

According to the Reading Next report, “Very few older struggling readers (between fourth and twelfth grade) need help to read the words on a page, their most common problem is that they are not able to comprehend what they read” (Biancarosa & Snow, 2004, pg.3). This has led to a national focus on the need to improve reading comprehension strategies (The RAND Report, 2000).

Semantic mapping offers a variety of strategies to display graphically information within categories that are related to a central concept (Heimlich & Pittelman, 1986).

Students can take informational text from the content areas, and create a map that shows the relationship between concepts. Trabasso and Bouchard (2002, p.179) reviewed 11 studies that used graphic organizers. They found that “teaching readers to use systematic, visual graphs in
order to organize ideas benefited readers in remembering what they read and improved reading comprehension and achievement in social studies and science.”

Answering questions can assist the reading in understanding information by stating information that is in a sentence, implied meaning presented in two or more sentence or information not in the text but is a part of the readers’ experience (Armbruster, Lehr, & Osborn, 2003).

“The process of explaining their thinking helps students deepen their understanding of the principles they are applying” (Marzano, Pickering & Pollock, 2001) p. 105).

A few classrooms were implementing word processors for writing, but most of the technology was used for drill and practice of particular skill sets (McNabb, 2005).

In contrast of that study, Ted Hasselbring, 1997, found students who have used technology supports for reading interventions have made gains and report they do not feel singled out. Technology assisted in building their self-esteem (Hasselbring, et al, 1997).

Over two thirds of U.S. adolescents have difficulties with reading proficiently (Biancarosa, 2005). The use of technology could provide the additional support that they need. Dole, Brown & Trathen, 1996, reported, “Struggling readers who are given cognitive strategy instruction show significant reading comprehension improvement over students trained with conventional reading instruction methods (Dole, Brown & Trathen, 1996).

Recent research suggests that it takes teachers several years to learn how to provide reading strategy instruction, since it requires a shift from teacher-directed instruction with a focus on asking and answering questions, to teaching that is focused on thinking processes, problem solving, and interactive learning with students (Duffy, 1993).

The teaching of strategic reading requires teachers to modify some of their traditional practices such as teaching skills in isolation (Duffy & Roehler, 1986).

“Technology is both a facilitator of literacy and a medium of literacy. Effective adolescent literacy programs therefore should use technology as both an instructional tool and an instructional topic” (Reading Next Report, 2004, pg. 27).

Technology can accommodate various strengths and weaknesses of each medium (Rose & Meyer, 2002).

“The process of explaining their thinking helps students deepen their understanding of the principles they are applying” (Marzano, Pickering & Pollock, 2001) p. 105).

Reflecting – requires that students think back on their own work and responses throughout the text and evaluate how they are progressing as a reader (Dalton, Pisha, Eagleton, Coyne, & Deysher, 2001).

References


Resources in Assistive/Educational Technology for Reading Comprehension & Study Skills

Student Activity Books:
- Sharp, V. (2000). Make it with inspiration: Easily create concept maps, plan web pages, outline papers, brainstorm, and develop multimedia projects!. Visions Technology in Education: Eugene, OR.

Educator Informational Books:
Resources in Assistive/Educational Technology for Reading Comprehension & Study Skills

- Robb, L. *Teaching Reading in Social Studies, Science and Math*. Scholastic Professional Books: NYC.

**Journal Articles on Reading Comprehension & Study Skills**

- **Computer Based Concept Mapping**—Lynne Anderson-Inman, & Leslie Ditson Learning & Leading with Technology, May 1999
- **Everyday Study Skills**—Michele Goodstein Scholastic Instructor, September 2004
- **Literacy Skills and The Internet**—Mary L. McNabb Learning & Leading with Technology, March 2001
- **Old Texts and Opera – Inciting Students to Read**—Yaroslav Senyshyn Educational Leadership, April 2005
- **Self-Regulated Strategy Development Instruction for Expository Text Comprehension**—Linda H. Mason, Hedda Meadan, Laura Hedin & Laurie Corso; Teaching Exceptional Children, March/April 2006
- **Taking Back the Class**—Eric Hellweg Edutopia, July/August 2006
- **Technology to Help Struggling Students**—Heidi Silver-Paucilla & Steve Fleischman Educational Leadership, February 2006
- **The New Literacy: The 3Rs Evolve into the 4Es**—Sara Armstrong & David Warlick Technology & Learning, September 2004
- **The Relevance of Young Adult Literature**—B. Joyce Stallworth Educational Leadership, April 2006
- **They Can Because They Think They Can**—Richard T. Vacca Educational Leadership, February 2006
- **Tickets, Please: Watching Movies in Class**—Madeline Farbman Instructor, September 2005
- **Using a Computer-Adapted, Conceptually Based History Text to Increase Comprehension & Problem Solving Skills of Students with Disabilities**—T. Twyman, G.Tindal, University of Oregon Journal of Special Education Technology, Spring 2006
- **Using Digital Images to Engage Young Learners**—Judy Van Scoter Learning & Leading with Technology, May 2004
Web Resources for Electronic Text:
- Aesop’s Fables Online Collection  www.aesopfables.com
- Audible  www.audible.com
- Audiobooks Direct  www.audiobooksdirect.com
- Authors 4 Teens  www.authors4Teens.com
- Carol Hurst’s Children’s Literature Site  www.carolhurst.com
- Creative Commons (license)  www.creativeworks.org
- Digital Book Index  www.digitalbookindex.com
- Google Book Search with Shakespeare Site  www.google.com
- Government Printing Office Access  www.access.gpo.gov/su_docs
- Internet Archive  www.archive.org
- Internet Public Library  www.ipl.org
- Karaoke  www.midikaraoke.com/home/
- List of Dictionaries  www.math.uni-paderborn.de/dictionaries/dictionaries.html
- Project Gutenberg  www.promo.net/pg
- Reading A-Z  www.readinga-z.com
- Recordings for the Blind and Dyslexic  www.rfbd.org
- The Reading Corner  www.carr.lib.md.us/read

Web Resources for Literacy Information:
- ASCD: Assoc. for Supervision & Curriculum Dev.  www.ascd.org
- Book Adventure  bookadventure.or/kgi/bk/bk helpfind.asp
- BookTalks  www.nancykeane.com/booktalks
- Captioned Media Program  www.captionedmedia.org
- Center for Applied Special Technology  www.cast.org
- Center for Literacy and Disabilities Study  www.med.unc.edu/ahs/clsds/
- Children’s Picture Book Database  www.let_kids_pickpickbks
- Cliff Notes  www.cliffnotes.com
- Closing The Gap  www.closingthegap.com
- Computer-based Study Strategies  cbss.uoregon.edu
- Council for Exceptional Children  www.cec.sted.org
- Database of Award-Winning Children’s Literature  www.dawcl.com
- Division for Learning Disabilities of CEC  www.TeachingLD.org
- Douchette Index: K-12 Literature Based Ideas  www.educ.ucalgary.ca/litindex
- Family Education  www.familyeducation.com
- Foundation for Critical Thinking  www.criticalthinking.org
- Guided Reading for Comprehension  www.thefourblocks.org
- International Society for Technology in Ed.  www.iste.org
- Irlen Institute  www.irlen.com  or  irlenclinic.com
- Language Arts Cyber Guides  www.sdcoe.k12.ca.us/score/cyberguide.html
- LD OnLine  www.ldonline.org
- Makes Sense Strategies  wwwGraphicOrganizers.com
- Read, Write, Think  www.readwritethink.org
- Reading Rockets News  www.readingrockets.org
- Resource Room: Middle, Secondary & Adults w LD  www.resourceroom.net
- Sedita Learning Strategies  www.seditalearning.com
- SOS for Information Literacy  www.informationliteracy.org
- Spark Notes  www.sparknotes.com
- Special Education Technology Practice  www.knowledgebydesign.org
- Study Stack  www.studystack.com
- Taking the Mystery out of AT & LD  www.ldonline.org/ld_indepth/general/info/
Resources in Assistive/Educational Technology
for Reading Comprehension & Study Skills

- Tech 4 Learning  www.tech4learning.com
- Texas Reading Model  www.texasat.net

Product Resources:
- Aequus Technologies Corp. & CAST (Aspire Reader)  www.aequustechnologies.com
- Attainment (Kid Tips, School Rules)  www.attainmentcompany.com
- Crick (Click 5, ClozePro, Planet Wobble)  www.cricksoft.com
- Dolphin Computer Access LLC (Dolphin Tutor)  www.dolphinusacom
- Don Johnston Inc. (Draft Builder, Solo, Start-to-Finish)  www.donjohnston.com
- Eastgate Systems (Tinderbox)  www.eastgate.com
- EbSCO Publishing (Searchasaurus)  www.searchasaurus.com
- Franklin Learning Resources (Homework Wiz, Lang Master)  www.franklin.com
- Freedom Scientific Learning Group (WYNN, Test Talker)  www.freedomscientific.com/lsig/
- FTC Publishing (GamePak Interactive)  www.ftcpublishing.com
- Gh LLC (GH Player)  www.ghbraille.com/ghplayer.html
- Ghost Hunter Productions (Earth Academy readers)  www.theghosthunteronline.com
- Grolier Online (Grolier Encyclopedia)  go.grolier.com
- Harcourt (e-learning Online Library)  www.harcourtelearning.com
- Harmony Hollow Software (The Hat)  www.harmonyhollow.net/hat.shtml
- Inclusive Technologies (Studywiz)  www.inclusivetlc.com
- Inspiration Inc. (Inspiration, Kidspiration, Inspiration Palm)  www.inspiration.com
- IntelliTools Inc. (IntelliTools Classroom Suite)  www.intellitools.com
- Kurzweil Education Systems Inc. (Kurzweil 3000)  www.kurzweilleducationsystems.com
- Learning Magic (Reading Comprehension, Exploring Nature)  www.learningmagicinc.com
- Masterminds, LLC (Makes Sense Strategies)  www.GraphicOrganizers.com
- Mayer Johnson (Boardmaker Plus, Writing With Symbols)  www.mayer-johnson.com
- MetaText (Digital Textbooks, Study Guides)  www.MetaText.com
- Microsoft Inc. (Visio, One Note)  www.microsoft.com
- News Currents (One on One)  www.news currents.com
- News-2-You (symbol newspaper, Joey’s Locker)  www.news-2-you.com
- Omni Group (Omni Graffle, Omni Outliner)  www.omnigroup.com
- Onion Mountain Technology (highlighters, low tech)  www.onionmountaintechnologies.com
- Read Please (Read Please)  www.readplease.com
- Recordings for the Blind & Dyslexic (Ebooks)  www.rfbd.com
- Scholastic (Read180)  www.scholastic.com
- See It Right (Color Filters)  www.seekright.com
- Slater Software (Picture It, PixWriter, Read & Tell)  www.slatersoftware.com
- Smart Technologies (Smart Ideas Concept Mapping)  www.smarttech.com
- SoftTouch (My Own BookShelf, Test Me, Score Me)  www.softtouch.com
- Spark Space Inc (Spark Space)  www.sparkspace.com
- Text Help (Read and Write Gold, Word Smith)  www.texthelp.com
- Tom Snyder Productions (Thinking Reader, Decisions, That’s a Fact Jack)  www.tomsnyder.com
- Visions Technology in Education (Writer’s Companion)  www.toolsforteachers.com
- Think Map Inc. (Visual Thesaurus)  www.visualthesaurus.com
- Weekly Reader Press (Student Authors)  www.weeklyreader.com
- Widgit/Teach Grid (Communicate: InPrint & By Choice)  www.teachgrid.com
- WizCom Technologies (Reading Pen)  www.wizcomtech.com
- Write Brothers (Word Menu)  www.write-bros.com
**During Reading Activity Example – Read to Find Out**

From *Setting a Record* by Carson-Dellosa, Survivors: High Interest Non-Fiction

Everyone Read to...

<table>
<thead>
<tr>
<th>Read to find out... the main idea of this story.</th>
<th>We found out...</th>
</tr>
</thead>
<tbody>
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<td></td>
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<table>
<thead>
<tr>
<th>Read to find out.... what happened to Roy.</th>
<th>We found out...</th>
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<table>
<thead>
<tr>
<th>Read to find out... what to do to protect yourself from lightning</th>
<th>We found out...</th>
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</table>
Do you know how to protect yourself against lightning? Roy C. Sullivan could have helped you answer that question. He learned the hard way. You could even say his story is a little shocking.

Roy was hit by lightning seven times in 35 years. That is a world record. Each year, about one thousand people are struck by lightning and about one hundred of those people die. Even those that survive can have brain damage or other serious injuries. After being struck seven times, Roy lost a toenail and both eyebrows. Lightning once set his hair on fire. He also had scars on his shoulder, chest, stomach, ankle, and leg.

Roy became a serious weather watcher and knew all about lightning. He certainly knew that you can’t outrun it. A bolt of lightning can travel over 60,000 miles per second. Lightning can even run underground, traveling many feet from where it touched down.

There are some steps you can take to protect yourself from lightning. First, pay close attention to weather reports before going outside. As soon as you see lightning or hear thunder, seek shelter in a nearby building. If you’re not close to a building, get in a car, if possible. If neither of these are options for you, then move away from tall objects, such as trees or flagpoles, that lightning is more likely to strike. Avoid open fields or water. You should sit down or lay flat on the ground. This way you won’t be the tallest object in the area. That may feel silly, but it could prevent injuries or even death.

Roy Sullivan never set out to be a record holder. He knew that being struck by lightning is serious business. He was a very lucky man.
Have you ever heard of mace? It's a spray police officers use to restrain criminals. Some people carry mace to defend themselves. When sprayed in the face, attackers are in too much pain to fight back. Now, there is a spray especially for bears, and it helped one man and his friends survive a bear attack.

Pat Goodwin and four of his friends went backpacking on Kodiak Island in Alaska. They knew the island had bears but chose not to take any guns for protection. His friend Todd had purchased a can of pepper spray for bears. Goodwin and his friends laughed and told Todd that he had wasted his money. As it turned out, the can of pepper spray saved their lives.

On the last day of their camping trip, they were heading down a trail and saw a bear and its baby. Pat was yelling at the others to come and see the bears, as he excitedly took out his camera to get a picture. Then, the mother bear, called a sow, sniffed the air and began charging up the trail toward the hikers. Pat turned and ran, shouting at his friends to run. The hikers ran until they were cornered. The sow, wanting to protect her baby, approached the terrified group slowly, growling and snorting.

When the bear was 15 feet away, Pat tried to light a flare to throw at her, but it didn't work. Then, Todd came to the rescue with his pepper spray. He sprayed the sow with a fog of pepper spray. The bear pawed at her head, sneezing, and snorting, and then ran off. The pepper spray helped Pat, Todd, and their friends survive. It also saved the bear. If they had brought a gun instead of spray, the baby bear would have lost its mother that day.