



# TEXT COMPLEXITY

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# THINK, PAIR, SHARE

- Why is it important to use informational text in science classrooms?

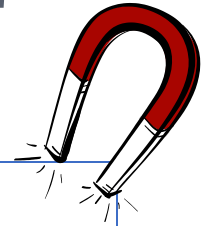
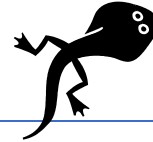


## WHY SHOULD WE?

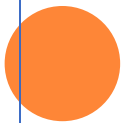
Students in school usually read informational text to answer questions at the back of the chapter, to complete a test prep worksheet, or simply because the teacher said to do so. Some of these activities may be unavoidable, but *we need to create classrooms in which students read informational text as often as possible for more compelling purposes*. In a recent study, 2nd and 3rd grade students whose teachers encouraged more authentic reading and writing of informational and how-to texts in science showed higher growth in reading comprehension as well as in writing (Purcell-Gates & Duke, 2003).



# HOW DO WE CREATE COMPELLING REASONS TO READ INFORMATIONAL TEXT?



Teachers can set up situations in which students need information, then encourage students to read to obtain that information. Students may want to find information about the life cycles of frogs before setting up a tadpole tank or learn about the needs of growing things before planting a window box. Teachers can pique students' curiosity: putting out some earthworms for students to observe; demonstrating that water left out in a pan on Friday has “disappeared” on Monday; setting out some magnets with various materials that the magnets will or will not attract. Students will read informational books and other print materials on earthworms, evaporation, and magnetism with greater interest and purpose after such activities as these.



# READING TO OR WITH?

- Informational text may be portioned into small segments for reading to or with students.
- There is not a plot moving from chapter to chapter with the reader left dangling at the end of a chapter so they will want to read on as in a novel.
- Readers can dip into nonfiction text, part by part.
- What about independent reading?



# READING IN SCIENCE: TEXT COMPLEXITY

<b>Qualitative</b> evaluation of the text	Levels of meaning, structure, language conventionality and clarity, and knowledge demands
<b>Quantitative</b> evaluation of the text	Readability measures and other scores of text complexity
<b>Reader &amp; Task</b>	Matching reader variables (such as motivation, knowledge and experiences) and task variables (such as purpose and complexity generated by the task assigned and the questions posed).



# READING IN SCIENCE: TEXT COMPLEXITY AND LEXILE SCORES

Text Complexity Grade Band in the Standards	Lexile Ranges Aligned to CCR expectations
K-1	N/A
2-3	450-790
4-5	770-980
6-8	955-1155
9-10	1080-1305
11-CCR	1215-1355

*From CCSS ELA Appendix A*



# ACCELERATED READER ATOS LEVELS

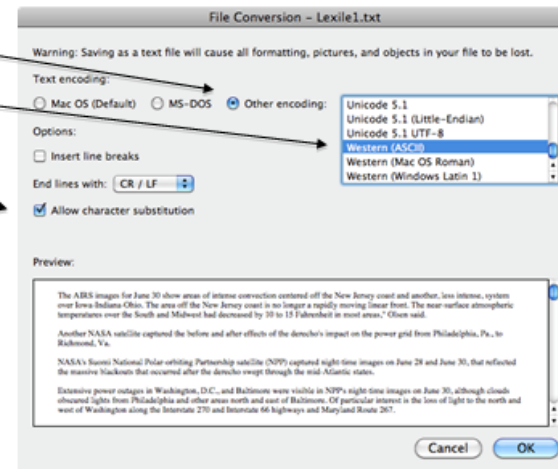
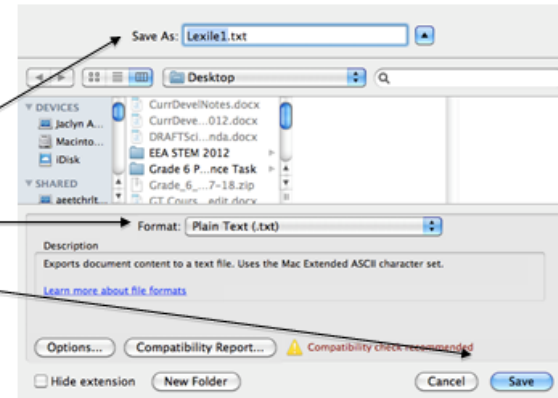
Grade Band	ATOS	Current Lexile	"Stretch" Lexile
K - 1	N/A	N/A	N/A
2 - 3	2.75 - 5.14	450L - 725L	420L - 820L
4 - 5	4.97 - 7.03	645L - 845L	740L - 1010L
6 - 8	7.00 - 9.98	860L - 1010L	925L - 1185L
9 - 10	9.67 - 12.01	960L - 1115L	1050L - 1335L
11 - CCR	11.20 - 14.10	1070L - 1220L	1185L - 1385L



# READING IN SCIENCE: ANALYZING LEXILE SCORES AT LEXILE.COM

## PREPARING AN ELECTRONIC DOCUMENT TO BE ANALYZED

1. Highlight and copy a sample of the article or text you want to analyze.
2. Paste this into a new Word document.
3. Go to "FILE", "SAVE AS" and give your file a name.
4. Below this, in the FORMAT box you must change the format to a Plain text (.txt) file. Click "SAVE".
5. A new window will pop up and you must select "OTHER ENCODING".
6. Select "WESTERN(ASCII) or US(ASCII)".
7. Make sure to check the box labeled, "ALLOW CHARACTER SUBSTITUTION". Click "OK"
8. Your document is now ready for the online Lexile Analyzer tool.



## USING THE ONLINE LEXILE ANALYZER

1. Navigate to <http://www.Lexile.com>
2. Click on "LEXILE TOOLS" and select "LEXILE ANALYZER".
3. Create an account for free with Lexile.com to be able to access this resource.
4. Upload your file and the Lexile score is produced.

# READING IN SCIENCE: TEXT COMPLEXITY

## QUALITATIVE MEASURES

### QUALITATIVE DIMENSIONS OF TEXT COMPLEXITY INFORMATIONAL TEXT

Text Structure			
<b>Complex</b> <ul style="list-style-type: none"> <li>Complex/implicit/unconventional informational structures</li> <li>If present, illustrations/graphics/text features are sophisticated, essential to understanding and provide information not otherwise conveyed in the text</li> </ul>	<b>Mostly Complex</b> <ul style="list-style-type: none"> <li>Some complexities and unconventionality; more implicit than explicit</li> <li>If present, illustrations/graphics/text features are sophisticated, may be essential to understanding and provide information not otherwise conveyed in the text</li> </ul>	<b>Mostly Simple</b> <ul style="list-style-type: none"> <li>Primarily simple and conventional; more explicit than implicit</li> <li>If present, illustrations/graphics/text features enhance reader's understanding and supplement understanding of the text</li> </ul>	<b>Simple</b> <ul style="list-style-type: none"> <li>Simple/explicit/conventional informational text structures</li> <li>If present, illustrations/graphics/text features are unnecessary or supplementary to understanding the text</li> </ul>
Language Conventionality and Clarity			
<b>Complex</b> <ul style="list-style-type: none"> <li>Complex sentence structures</li> <li>Strongly employs the use of irony, abstract, and/or figurative language</li> <li>Complex language (generally unfamiliar, archaic, ambiguous, and/or purposefully misleading)</li> <li>Sophisticated use of vocabulary that is multi-meaning, connotative, conceptual, academic, and domain-specific</li> </ul>	<b>Mostly Complex</b> <ul style="list-style-type: none"> <li>Primarily complex sentence structures</li> <li>Employs the use of irony, abstract, and/or figurative language</li> <li>Moderately complex language (generally unfamiliar, archaic, ambiguous, and/or purposefully misleading)</li> <li>Some sophisticated vocabulary that is multi-meaning, connotative, conceptual, academic, and domain-specific</li> </ul>	<b>Mostly Simple</b> <ul style="list-style-type: none"> <li>Primarily simple sentence structures with modest use of complex structures</li> <li>Predominantly literal language with moderate use of figurative language and/or irony</li> <li>Primarily clear, contemporary, familiar, and/or conversational language</li> <li>Largely simple vocabulary with moderate use of vocabulary that is multi-meaning, connotative, conceptual, academic, and/or domain-specific</li> </ul>	<b>Simple</b> <ul style="list-style-type: none"> <li>Simple sentence structures.</li> <li>Literal language</li> <li>Clear, contemporary, familiar, and/or conversational language</li> <li>Simple vocabulary</li> </ul>
Levels of Meaning or Purpose			
<b>Complex</b> <ul style="list-style-type: none"> <li>Subtle, implied, difficult to determine theme and/or purpose</li> <li>Sophisticated, multiple themes and perspectives</li> <li>Perspectives and experiences distinctly different from the common reader</li> <li>High inter-textuality (many references to/citations of other texts)</li> </ul>	<b>Mostly Complex</b> <ul style="list-style-type: none"> <li>Implied but fairly easy to infer theme and/or purpose</li> <li>Multiple themes and perspectives</li> <li>Perspectives and experiences uncommon to most readers</li> <li>Inter-textuality (some references to/citations of other texts)</li> </ul>	<b>Mostly Simple</b> <ul style="list-style-type: none"> <li>Implied but easy to identify theme and/or purpose based upon context</li> <li>Primarily single themes and perspectives</li> <li>Perspectives and experiences common to many readers</li> <li>Moderate inter-textuality (few references to/citations of other texts)</li> </ul>	<b>Simple</b> <ul style="list-style-type: none"> <li>Explicitly stated theme and/or purpose</li> <li>Single themes and perspectives</li> <li>Familiar perspectives and common everyday experiences</li> <li>No inter-textuality (no references to/citations of other texts)</li> </ul>
Knowledge Demands			
<b>Complex</b> <ul style="list-style-type: none"> <li>Requires extensive and specialized experiences and knowledge</li> <li>Requires a depth of discipline-specific content knowledge</li> </ul>	<b>Mostly Complex</b> <ul style="list-style-type: none"> <li>Requires specialized experiences and knowledge</li> <li>Requires some discipline-specific content knowledge</li> </ul>	<b>Mostly Simple</b> <ul style="list-style-type: none"> <li>Requires everyday knowledge with modest experiences</li> <li>Requires some discipline-specific content knowledge</li> </ul>	<b>Simple</b> <ul style="list-style-type: none"> <li>Requires everyday knowledge</li> <li>Requires familiarity with genre conventions</li> </ul>

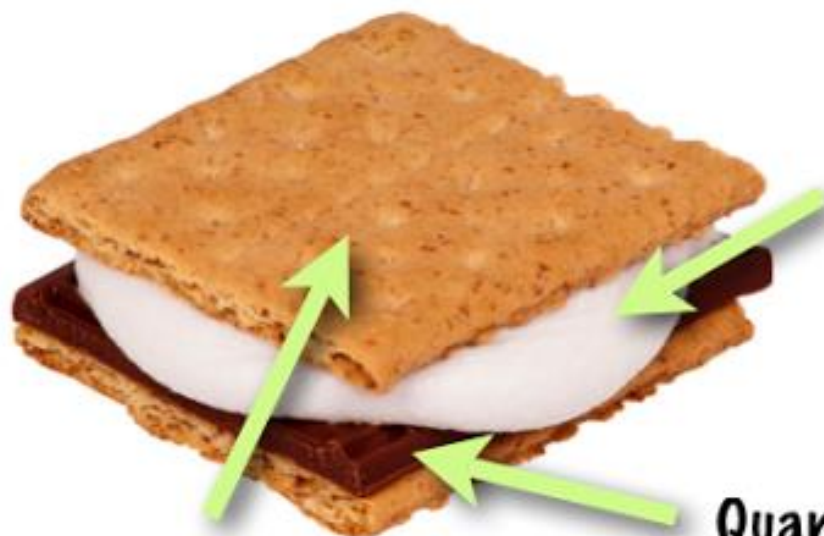
# READING IN SCIENCE: TEXT COMPLEXITY MATCHING READERS AND TEXTS

## READER AND TASK CONSIDERATIONS FOR TEXT COMPLEXITY

Cognitive Capabilities
<p>To what degree ...</p> <ul style="list-style-type: none"> <li>• <b>do</b> the readers possess the attention span necessary to read and comprehend the text?</li> <li>• <b>will</b> the readers be able to remember and make connections among the various details presented in the text?</li> <li>• <b>do</b> readers possess the critical/analytical thinking skills necessary to understand the relationships between and among the various parts of the text?</li> <li>• <b>can</b> the text be sufficiently scaffolded to overcome any deficits in cognitive capabilities?</li> </ul>
Reading Skills
<p>To what degree ...</p> <ul style="list-style-type: none"> <li>• <b>do</b> the readers possess the necessary reading skills (foundational skills, <b>inferencing</b>, questioning, comprehension strategies) to understand and make connections in the text?</li> <li>• <b>can</b> the text be sufficiently scaffolded to overcome any deficits in reading skills?</li> </ul>
Motivation and Engagement with Task and Text
<p>To what degree ...</p> <ul style="list-style-type: none"> <li>• <b>will</b> the readers be interested in the content of the text?</li> <li>• <b>will</b> the readers be interested in and engaged with the style of writing and/or the presentation of ideas within the text?</li> <li>• <b>will</b> the readers be able to understand the purpose for reading the text, which might shift over the course of the reading experience (i.e., skimming, studying to retain content, close reading, etc.)?</li> <li>• <b>can</b> sufficient motivation be developed to increase the reader's enthusiasm and engagement with the task and text?</li> </ul>
Prior Knowledge and Experience
<p>To what degree ...</p> <ul style="list-style-type: none"> <li>• <b>do</b> the readers possess adequate prior knowledge of and/or experience with the topic, the vocabulary, the genre, the language (i.e., syntax, diction, rhetoric) of the text?</li> <li>• <b>can</b> connections be made between the content of the text and other learning experiences?</li> <li>• <b>can</b> deficits in prior knowledge of and/or experience with the topic, the vocabulary, the genre, and/or the language be overcome with minimal instructional time?</li> </ul>
Content and/or Theme Considerations
<p>To what degree ...</p> <ul style="list-style-type: none"> <li>• <b>does</b> the text contain sensitive issues or topics (e.g., gender-bias, cultural stereotypes, age-bias, sexuality, outdated perceptions, etc.) that some readers may find inappropriate?</li> <li>• <b>does</b> the text contribute to a balance of diversity throughout the course or grade level reading selections?</li> <li>• <b>do</b> the readers possess the maturity to respond appropriately to any potentially sensitive issues or topics?</li> <li>• <b>can</b> potentially sensitive topics or issues be addressed through the creation of a safe classroom environment and open communication with students and parents?</li> </ul>
Associated Tasks
<p>To what degree ...</p> <ul style="list-style-type: none"> <li>• <b>will</b> the characteristics of any tasks and/or questions (complexity, length, relevance, etc.) associated with the text interfere with the reading experience?</li> <li>• <b>do</b> all the tasks and/or questions require the reader to stay grounded in the text?</li> </ul>



# S'more about Text Complexity



## Reader and Task

ingredients of text complexity include student motivation, interest, and background knowledge about the text/topic. -- Knowing your students helps you get a 'handle' on this s'more.

**Qualitative** ingredients of text complexity include the levels of meaning (literary elements); the purpose (explicit or implicit); language conventionality/clarity (literal vs. figurative); and the maturity for which the text is appropriate for. -- A computer can't determine this.

**Quantitative** ingredients of text complexity include word length, word frequency, and sentence length. The Lexile text measure and ATOS measure (used in AR) are examples of this. -- Computers can do this analysis through algorithms.

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# STRATEGIC READING IN SCIENCE

## **BEFORE READING- scientifically literate individuals ask...**

- Do I recognize this type of selection?
- Is the source of this information reputable?
- Could the source have a bias?
- Does it give me information or tell directions? How do I know?
- What will this selection be about? Do the graphics tell me anything?
- Do I already know something about the topic that will help me?
- What questions do I have about the topic?
- What is my purpose for reading this selection?

## **DURING READING- scientifically literate individuals ask...**

- What have I learned so far?
- How can I figure out difficult words or parts of the selection I don't understand?
- Do the meanings of terms I know fit with the scientific context or do I need to learn more?
- What strategies will help me understand and remember this kind of reading?
- What is the author saying directly and what do they imply?
- Am I able to detect any bias in the information? Would another author or groups present the information differently?
- Can I visualize what has been described?
- Are the visuals in the text helpful to my understanding?

## **AFTER READING- scientifically literate individuals ask...**

- Did the questions I had before reading get answered?
- Did I learn what I wanted to? What can I do if I still have unanswered questions?
- Would I recommend this selection to someone else? Why or why not?
- Were my predictions about the selection correct?
- Do I agree with what the source said?
- How would I summarize what I read?
- Are there any parts that I should read again to be sure that I understand what it meant?
- How was this selection similar to and different from other information I have read on this topic?
- Do I have any personal experiences that tie in with this information?
- How might I use this information to investigate further?



# QUESTIONS? COMMENTS?

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