A Beginner’s Guide to Text Complexity
AUSSIE, NYCDOE Secondary Literacy Pilot
This document addresses the issues raised around text complexity in the...

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

And in particular...

Standard 10

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.
Introduction

The Common Core State Standards place an increasing emphasis on getting students to independently read the range and complexity of texts required to be college and career ready. The importance of both increasing the complexity of texts students read and the need for teachers to understand more about what makes their texts challenging arose out of research that showed nearly half of the students who graduate high school need some kind of remediation to cope with the reading required in college and during their careers. The research also showed that the clearest differentiator in reading between students who are college ready and students who are not is the ability to comprehend complex texts. (ACT 2006)

As students move through the grades they are faced with texts that are increasingly longer and more complex in terms of the vocabulary used, sentence structure and text organization. In middle and high schools the texts will present greater conceptual challenges, may include more detailed graphic representation, while at the same time demanding a much greater ability on the part of the reader to synthesize information.

Central to the Standards is the notion that the teacher is able to match students, texts and tasks to promote student learning. Teachers need to know whether students can independently read the range and complexity of grade level discipline-specific materials and if not, what supports and strategies they need. To do this, teachers need to have information on:

... their students as readers;
... the complexity of the texts they are using with the students, i.e. supports and challenges;
... the nature of the tasks they set (how students are going to interact with the text) and the level of support they will provide.

This guide is designed to help teachers to determine the complexity of the texts they use.

Students... “must also develop special skills and strategies for reading text in each of the differing content areas (such as English, science, mathematics and history)—meaning that a student who “naturally” does well in one area may struggle in another.”

ACT, Inc. (2006) Reading Between the Lines Iowa City, IA: Author
What do we mean by text complexity?

**Text Complexity is**

“The inherent difficulty of reading and comprehending a text combined with consideration of reader and task variables; in the Standards, a three-part assessment of text difficulty that pairs qualitative and quantitative measures with reader-task considerations.”

**CCSS Appendix A**

There is no exact science for determining the complexity of a text. Nor is there a single source of information that can accurately summarize the complexity of a text. Teachers need to use their professional judgment as they take into consideration a range of factors.

**Three Part Model**

The Common Core Standards introduce a three-part model for measuring text complexity. Teachers need to use their professional judgment as they draw on information from all three sources when determining the complexity of a text.

1 **Qualitative Measures**

The qualitative measures of text complexity require an informed judgment on the difficulty by considering a range of factors. The Standards use purpose or levels of meaning, structure, language conventionality and clarity and the knowledge demands as measures of text difficulty. (pg 6, CCSS Appendix A)

2 **Quantitative Measures**

Quantitative measures of text complexity use factors such as sentence and word length and frequency of unfamiliar words to calculate the difficulty of the text and assign a single measure (grade level equivalent, number, Lexile etc). There are many formulas for calculating text difficulty and, while they provide a guide, the readability or difficulty level of a text can vary depending on which formulas or measures are used. (pg 8, CCSS Appendix A)

3 **Reader and Task**

The third measure looks at what the student brings to the text and the tasks assigned. Teachers need to use their knowledge of their students and the texts to match texts to particular students and tasks. (pg 9, CCSS Appendix A)
How do we determine the complexity of texts?

The Common Core Standards raise the expectation for students in terms of the complexity of the texts they read. This means teachers need to be familiar with the level of complexity expected at the grade levels they teach and how these compare to the complexity of the texts they use in their classes. Several considerations should guide teachers in selecting their texts and designing text-based instruction.

1. Quantitative Measures

The quantitative measures provide a very useful guide in determining the complexity of texts. They are, however, not sufficient when used in isolation. Most publishers give grade band equivalents, or Lexile levels, for their texts. A book with a Lexile of 1200 will be considerably more complex than one with a 770 Lexile. The quantitative measure indicates how complex a text is, but does not explain the nature of the complexity. Quantitative measures are determined using readability formulas.

Readability Formulas

There are five readability formulas that are commonly used to measure the complexity of texts. While all can be calculated manually, there are computer programs that calculate readability when you paste in a section of 100-200 words. For instance, lexile.com, offers a free readability analysis using the Lexile framework, and provides results that are aligned to the Common Core State Standards. Other commonly used readability formulas include:

*The Flesch Reading Ease Readability Formula* and the *The Flesch-Kincaid Grade Level Readability Formula* calculate difficulty using sentence length and number of syllables per word.

*Gunning’s Fog Index (or FOG) Readability Formula* uses sentence length and percentage of Foggy words (words with three or more syllables).

*The Dale-Chall Readability Formula* uses sentence length and percentage of difficult words (words that do not appear on the familiar word list).

The quantitative measures are not sufficient in themselves. There is no question that sentence length, number of syllables in words, and word frequency impact difficulty. There is a wide range of factors that influence the complexity of a text. To be able to match students and texts, teachers need to know where the complexity lies within a text to ensure they provide students with the supports and strategies needed to successfully read the texts.

See appendix A of this guide for more detail on readability formulas.
2. Qualitative factors for describing complexity

Qualitative measures of text complexity provide valuable information when making decisions about the complexity of the text and how it could best be used with students. The Common Core State Standards identify a range of qualitative factors that interact to contribute to the overall complexity. Rubrics have been developed for both literary and informational texts that include descriptors for:

- layout;
- purpose and meaning;
- text structure;
- language features;
- knowledge demands.

Not all descriptors described in each of the categories will necessarily occur together at each level of complexity. A text may have very simple vocabulary and short, simple sentences yet still be complex because the ideas expressed are subtle.

Gradients in text complexity (Literary Texts)

<table>
<thead>
<tr>
<th>Simple Texts</th>
<th>Somewhat Complex Texts</th>
<th>Complex Texts</th>
<th>Very Complex Texts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Layout</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consistent placement of text, regular word and line spacing, when large block text</td>
<td>A single or multiple paragraphs or narratives, when large block text</td>
<td>Larger paragraphs of uninterrupted text may include sections or other variations in layout, often smaller more elaborate text</td>
<td>Very long paragraphs of uninterrupted text that may include sections or other variations in layout, often small densely packed print</td>
</tr>
<tr>
<td>Gravity dispersed text that slightly disrupts the reading process</td>
<td>A range of disruptions that slight disrupted text</td>
<td>The organization of the text is intricate with regard to elements such as narrative viewpoint, time shifts, multiple characters, and internal and external dialogue</td>
<td>The organization of the text is intricate with regard to elements such as narrative viewpoint, time shifts, multiple characters, and internal and external dialogue</td>
</tr>
<tr>
<td>Purpose and Meaning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purpose is explicit, usually stated directly in the title or at the beginning of the text</td>
<td>Purpose is implicit and may be revealed over the entirety of the text</td>
<td>Purpose is implicit or subtle, is often ambiguous, and is revealed over the entirety of the text</td>
<td>Purpose is implicit or subtle, is often ambiguous, and is revealed over the entirety of the text</td>
</tr>
<tr>
<td><strong>Signposting and Enhancements</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The organization of the text is clear, straightforward, and easy to navigate</td>
<td>The organization of the text may have additional characters, themes, shifts, and more complex elements</td>
<td>The organization of the text may include multiple characters, themes, shifts, and more complex elements</td>
<td>The organization of the text is intricate with regard to elements such as narrative viewpoint, time shifts, multiple characters, and internal and external dialogue</td>
</tr>
<tr>
<td><strong>Vocabulary</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mostly simple sentences</td>
<td>Simple and compound sentences with some more complex constructions</td>
<td>Many complex sentences, often containing intricate non-linear structure</td>
<td>Many complex sentences, often containing intricate non-linear structure</td>
</tr>
<tr>
<td>Mostly simple and familiar language</td>
<td>Simple and compound sentences with some more complex constructions</td>
<td>Many complex sentences with increased subtextual physical and cultural elements</td>
<td>Many complex sentences with increased subtextual physical and cultural elements</td>
</tr>
<tr>
<td><strong>Organizational Structure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Each assumed personal experience or cultural knowledge</td>
<td>Some assumed personal experience and/or cultural knowledge</td>
<td>Much assumed personal experience and/or cultural knowledge</td>
<td>Many assumed personal experience and/or cultural knowledge</td>
</tr>
<tr>
<td>Simple ideas</td>
<td>Simple and more complicated ideas</td>
<td>More complex ideas</td>
<td>Many more ideas and/or concepts</td>
</tr>
</tbody>
</table>

By using a rubric it is easy to see where the complexity of the text lies. If teachers know what aspects of the text are likely to be challenging for students, they can make decisions about the suitability of a text and what strategies or supports students may need to read it successfully.

(Please note that this rubric is available on the Common Core Library.)
3. What about the reader and the task?

Qualitative and quantitative measures describe the complexity within the text. The Common Core’s definition of text complexity also encourages educators to consider our students and how we are expecting them to interact with the text. In any class there will be a range in the students’ ability to read complex texts. Teachers will need to use their professional judgment when making decisions about what texts to use and how they should be used. This professional judgment is dependent on the teachers’:

- knowledge of their students as readers;
- understanding of the complexity of the texts;
- ability to use a range of instructional approaches flexibly.

Tasks, like texts, become more complex as students consider ideas and information in different ways. There is a “gear shift” from locating and evaluating items of information on a topic through to locating, evaluating, and synthesizing information from several different sources.

**Balancing the supports and challenges**

The more complex the text, the more support students will need. Students will be introduced to increasingly complex texts throughout middle and high school. This is done through a gradual release of responsibility where complex texts are introduced in a supportive context that facilitates higher levels of independence.

Teacher support increases with the complexity of the text

Reading complex texts requires students to actively engage with texts as they make meaning. This requires commitment and risk taking on the part of the reader. Students will not put this amount of effort into texts that are irrelevant and uninteresting or where they see no value in the tasks assigned.
Example of Text Complexity, Literary:

The Book Thief by Markus Zusak

Exemplar Text for Grades 9-10 Text Complexity Band (Appendix B CCSS)

Lexile: 730L

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A beginning.
Where are my manners?

I could introduce myself properly, but it's not really necessary. You will know me well enough and soon enough, depending on a diverse range of variables. It suffices to say that at some point in time, I will be standing over you, as genially as possible. Your soul will be in my arms.

A color will be perched on my shoulder. I will carry you gently away.

At that moment, you will be lying there (I rarely find people standing up). You will be caked in your own body. There might be a discovery; a scream will dribble down the air. The only sound I'll hear after that will be my own breathing, and the sound of the smell, of my footsteps.

The question is, what color will everything be at that moment when I come for you? What will the sky be saying?

Personally, I like a chocolate-colored sky. Dark, dark chocolate. People say it suits me. I do, however, try to enjoy every color I see in the whole spectrum. A billion or so flavors, none of them quite the same, and a sky to slowly suck on. It takes the edge off the stress. It helps me relax.

Much of the text is figurative with extensive use of metaphor.

The narrator is not identified until part way through the text.

The personification of death throughout the text.

Innovative stylistic techniques are used. The most obvious is the narrator’s (Death) use of boldface text to relay certain information.

Figurative language.

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**A SMALL THEORY**

People observe the colors of a day only at its beginnings and ends, but to me it's quite clear that a day merges through a multitude of shades and intonations, with each passing moment. A single hour can consist of thousands of different colors. Waxy yellows, cloud-spat blues. Murky darknesses.

In my line of work, I make it a point to notice them.

---

As I've been alluding to, my one saving grace is distraction. It keeps me sane. It helps me cope, considering the length of time I've been
The Book Thief, continued

This text highlights the importance of not relying solely on quantitative measures. The Lexile level is 730 L, which would suggest the book is suitable for grades 3 and 4 students (see chart on pg 14 of this guide). However, it is an exemplar text for grades 9-10 in the Standards. The complexity becomes evident when the qualitative measures are used.

Students are likely to find the following characteristics challenging:

- the historical setting;
- much of the text is figurative with extensive use of metaphor, including the personification of death itself;
- the text is long – 552 pages;
- the innovative stylistic techniques used. The most obvious is the narrator Death’s use of boldface text to relay certain information;
- the intertwining, multiple themes.
Example of Text Complexity, Informational:

“Thinking about physics while scared to death (on a falling roller coaster)” by Jearl Walker


THE AMATEUR SCIENTIST

Thinking about physics while scared to death (on a falling roller coaster)

by Jearl Walker

Rides in an amusement park not only are fun but also demonstrate principles of physics. Among them are rotational dynamics and energy conversion. I have been exploring the rides at Geauga Lake Amusement Park near Cleveland and have found that nearly every ride offers a memorable lesson.

To me the scariest rides at the park are the roller coasters. The Big Dipper is similar to many of the roller coasters that have thrilled passengers for most of this century. The cars are pulled by a train to the top of the highest hill along the track. Released from the chain as the front car begins its descent, the unpowa

The peak acceleration is by gravity and the sine of the slope of the track. A steeper descent generates a greater acceleration, pummeling the coaster with heavier passengers does not.

When the coaster reaches the bottom of the valley and starts up the next hill, there is an instant when the cars are momentarily distributed in the valley. The acceleration is zero. As more cars ascend, the coaster begins to slow, reaching its lowest speed just as it is symmetrically positioned at the top of the hill.

A roller coaster functions by means of transfers of energy. When the chain hauls the cars to the top of the hill, it does work on the cars, endowing them with gravitational potential energy, the energy of a body in a gravitational field with respect to the distance of the body from some reference level such as the ground. As the cars descend into the first valley much of the stored energy is transferred into kinetic energy, the energy of motion.

If the loss of energy to friction and air drag is small, the total of the potential and kinetic energies must remain constant throughout the descent and even throughout the rest of the ride. The coaster gains kinetic energy and speed as the expense of potential energy. If the first valley is at ground level, the transfer is complete, and for a moment the coaster has all its energy in the form of kinetic energy.

Without energy losses the coaster could climb any number of hills as high as the one from which it is released (but no higher). To be sure, friction and air drag do remove energy from the coaster, and its total energy content dwindles. It can no longer climb high hills, which is why the last stages of the track consist only of low hills.

The length of a ride on a roller coaster depends on the speed. If the ride is too fast, the launching hill should be high so that the total energy is large. The rest of the track should be low so that most of the energy remains kinetic.

The choice of a seat on a roller coaster makes a difference in the ride. Some people prefer the front seat because the descent from the launching site presents the pleasantly frightening illusion of falling over the edge of a cliff. Other people prefer the psychological security of the rear seat.

The choice of a seat also determines the forces felt by the passenger. Consider the first descent. The front car starts down slowly because little of the coaster's energy is then kinetic. The speed of the cars increases as an exponential function of time, so that the rear car starts down at a much higher speed than the front car did. Although the passengers in the front car are not as safe as those in the rear car have a stronger sense of being hurted over the edge. At the edge one force on the passenger is from the change in the direction of his momentum vector. Initially the vector is horizontal, but soon it points toward the valley. The force necessary to effect this change in direction is delivered by the safety bar or seat belt that keeps the passenger in the car. That force, which points downward and back toward the hill, is part of the thrill of the ride. A passenger in the rear feels the force more than a passenger in the front because the size of the force is proportionally related to the momentum, which is greater for the passenger in the rear.

The story is different in the valley. Again a force from the coaster is necessary to redirect the passenger’s momentum. This time the momentum is initially downward toward the bottom of the valley and then is redirected toward the top of the next hill. The front passenger has a large momentum and is subjected...


**“Thinking about physics while scared to death (on a falling roller coaster)” by Jearl Walker, continued**

Exemplar Text for Grades 9-10 Text Complexity Band (Appendix B)
Flesch-Kincaid Grade Level puts the readability at the 8th grade level.

The language structure of this text is relatively straightforward; however, the complexity lies in the domain-specific vocabulary, complex embedded sentences and the difficulty of the ideas being explained.

Students are likely to find the following characteristics challenging:

- the domain-specific vocabulary;
- the knowledge demands of the physics concepts of motion and force;
- small, densely packed print;
- nominalization;
- minimal use of diagrams, e.g. to show directions of forces.

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**Text Complexity Rubric for “Thinking about physics while scared to death”**

<table>
<thead>
<tr>
<th>Layout</th>
<th>Purpose and Meaning</th>
<th>Structure</th>
<th>Language Features</th>
<th>Knowledge Demands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistent placement of text, regular word and line spacing, often large plain font</td>
<td>Purpose involves conveying a range of more detailed information</td>
<td>The organization of the text is clear and chronological and/or easy to predict</td>
<td>Mainly simple sentences</td>
<td>General topic is familiar, with details known by reader</td>
</tr>
<tr>
<td>May have longer passages of uninterrupted text, often plain font</td>
<td>Purpose includes explaining or interpreting information</td>
<td>The organization of the text may contain multiple pathways, more than one thesis and/or several genres</td>
<td>Simple and compound sentences with some more complex constructions</td>
<td>General topic is familiar, with some details new to reader</td>
</tr>
<tr>
<td>Longer passages of uninterrupted text may include columns or other variations in layout, often smaller more elaborate font</td>
<td>Meaning is more involved with a broader focus</td>
<td>Connections between an expanded range ideas, processes or events are implicit or subtle</td>
<td>Increased objective style and passive constructions with higher factual content</td>
<td>Both simple and more complicated, abstract ideas</td>
</tr>
<tr>
<td>Very long passages of uninterrupted text that may include columns or other variations in layout, often small densely packed print</td>
<td>Meaning includes more complex concepts and a higher level of detail</td>
<td>Connections between an extensive range ideas, processes or events are deep, intricate and often implicit or subtle</td>
<td>Objective/passive style with higher conceptual content and increasing nominalization</td>
<td>A range of recognizable ideas and challenging abstract concepts</td>
</tr>
<tr>
<td>Essential integrated graphics, tables, charts, formulas necessary to make meaning of text</td>
<td>The organization of the text is intricate or specialized for a particular discipline</td>
<td>Connections between different areas, genres, pathways, more than one thesis and/or several genres</td>
<td>Includes extensive academic and domain specific content vocabulary</td>
<td>Many new ideas and/or complex, challenging, abstract and theoretical concepts</td>
</tr>
<tr>
<td>Extensive, intricate, essential integrated tables, charts, formulas necessary to make meaning of text</td>
<td>Integrated supporting conforming to disciplinary formats, no enhancements</td>
<td>Integrated supporting conforming to disciplinary formats, no enhancements</td>
<td>Includes sustained complex text types and/or specialized, hybrid text types</td>
<td>Includes sustained complex text types and/or specialized, hybrid text types</td>
</tr>
</tbody>
</table>

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Planning for Support

Tasks, like texts, become more complex as students think about ideas and information in different ways. When considering the complexity of the text teachers need to take into account the tasks they set, as well as their knowledge of their students as readers.

When introducing texts teachers need to consider the challenges in the text and the strategies students need.

### Professional Practice

The way in which ideas and information are presented to students and the opportunities and scaffolds provided for them to engage with texts are critical elements of teacher practice that can shape students' success in navigating complex texts.

Teachers need to provide multiple, differentiated points of entry to texts.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Text Title</th>
<th>Complexity Level</th>
<th>Text Structure and Concepts Challenges</th>
<th>Planned Teacher Supports</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th Grade ELA</td>
<td>The Book Thief by Markus Zusak</td>
<td>Exemplar Text for Grades 9-10 Text Complexity Band (Appendix B CCSS)</td>
<td>1. figurative language with extensive use of metaphor and analogy 2. the text is a very long 552 pages 3. the use of innovative stylistic techniques. The most obvious is narrator Death's use of boldface text to relay certain information</td>
<td>Activate connections to 8th grade work on Holocaust Read first 3 chapters aloud to familiarize students with language Guide thinking around narrator Provide activities that locate figurative language Character webs to track changes in characters</td>
</tr>
<tr>
<td>10th Grade Physics</td>
<td>Flying Circus of Physics by Jeanel Walker</td>
<td>Exemplar Text for Grades 9-10 Text Complexity Band (Appendix B CCSS) Flesch-Kincaid Grade Level puts the readability at the 8th grade level</td>
<td>1. the domain specific vocabulary- 2. the knowledge demands around motion and force 3. difficulty of the concepts being explained 4. lack of illustrations or diagrams to help visualize the explanations.</td>
<td>Make links to previous learning Use anticipation guides to predict Sketch to stretch to help visualize concepts being introduced.</td>
</tr>
</tbody>
</table>
Appendix A (of “Beginner’s Guide to Text Complexity”)  
**Readability Formulas**

There are five commonly used readability formulas. While all can be calculated manually, there are computer programs that do this for you by pasting in a section of 100-200 words. @ReadabilityFormulas.com, for instance, offers a free readability analysis and gives results using the four most common used readability scores.

1. **The Flesch Reading Ease Readability Formula**  
The specific mathematical formula is:

   \[
   \text{Readability Ease} = 206.835 - (1.015 \times \text{average sentence length}) - (84.6 \times \text{average syllable per word}).
   \]

   The higher the number, the easier the passage: 90-100, very easy and 0-29, very confusing.

2. **The Flesch-Kincaid Grade Level Readability Formula**  
The specific mathematical formula is:

   \[
   \text{Flesch-Kincaid Reading Age} = (0.39 \times \text{average sentence length}) + (11.8 \times \text{average syllable per word}) - 15.59
   \]

   The score is given as a grade level equivalent – a score of 9.4 would be 9th grade.  
   Flesch-Kincaid Grade Level Readability Formula is built into the MS-Word application.

3. **Gunning’s Fog Index (or FOG) Readability Formula**  
The specific mathematical formula is:

   \[
   \text{Grade Level} = 0.4 (\text{Average Sentence Length} + \text{Percentage of Hard Words}).
   \]
   Hard words are defined as words with three or more syllables.

4. **The Dale-Chall Readability Formula**  
The specific mathematical formula is

   \[
   \text{Raw Score} = 0.1579 \times \text{Percentage of Difficult Words} + 0.0496 \times \text{Average Sentence Length in words} + 3.6365
   \]

   Raw scores convert to grade levels with scores 5.0 to 5.9 = Grades 5 – 6 and 8.0 to 8.9 = Grades 11 - 12
   Difficult words are words that do not appear on the Chall word list of over 3000 familiar words.

5. **The Fry Graph Readability Formula**  
The Fry readability formula uses three 100 word passages and calculates the
average number of words per sentence and the number of syllables per 100 words.

that appear in the dark area (long sentences and long words) are invalid.

Many companies are in the process of adjusting their leveling systems to align to the raised expectations for standards. The following chart shows how MetaMetrics has realigned its Lexile ranges to align to expectations for College and Career Readiness.

Fig 3: Text Complexity Grade Bands and Associated Lexile Ranges (in Lexiles) – from page 8 of the Common Core State Standards, Appendix A

<table>
<thead>
<tr>
<th>Text Complexity Grade Band in the Standards</th>
<th>Old Lexile Ranges</th>
<th>Lexile Ranges Aligned to CCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>K–1</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2–3</td>
<td>450–725</td>
<td>450–790</td>
</tr>
<tr>
<td>4–5</td>
<td>645–845</td>
<td>770–980</td>
</tr>
<tr>
<td>6–8</td>
<td>860–1010</td>
<td>955–1155</td>
</tr>
</tbody>
</table>

To use the Lexile framework online go to: [http://www.lexile.com/](http://www.lexile.com/)

To find the readability formula for a text there are two options.

--Use the “Quick Book Search” (most suitable for published books)

--Use the “Lexile Analyzer” (Most suitable for articles. A free account is required to use this function.)