

Creating *i+1* Content Area Readings for
English Learners

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Chapter 1

Welcome

Traditional content area (science, math, English, social studies) texts are often written at much higher levels than English Language Learners (ELLs¹) can handle. If students struggle to understand a text, they will struggle to acquire the content. Even when close to students' level, readings may not be written with awareness of language acquisition issues in mind, which can also increase the difficulty English learners have acquiring the content.

In this workshop, we will look at several tools that teachers can use to create new, or modify existing, content area readings. Participants will: discuss issues that ELLs face with regard to acquiring the content in content area readings; practice using tools to analyze readings; and, technology permitting, create their own new or modified readings. The main focus will be on high school content areas, but the tools can be used with middle school readings and perhaps some elementary school readings.

Content from this workshop is available at <https://www.osugisakae.com/tesol/teaching-resources/ohio-tesol/2017/>.

¹I still use “ELL” because “EL” is used for “Expeditionary Learning”, which is practiced at some of the schools I go to.

Chapter 2

The Tools

In order to analyze the difficulty or grade level of readings, we are going to look at two basic categories of data: data about the length of words and sentences, and data about the actual words chosen for the text. The first gives us a *readability score*, usually a U.S.A. grade level. The second gives us a *vocabulary profile*, which shows us how common the vocabulary in the reading is.

There are several web sites for finding the readability scores. One I use frequently is <http://www.readabilityformulas.com/free-readability-formula-tests.php>.

There is one excellent web site that I use to find the vocabulary profile. It is <https://www.lex tutor.ca/vp/eng/>.

We will see how we use these tools, as we look at some examples of texts assigned to students. There are links and short comments about these and other sites on page 30.

Chapter 3

The Problem

Asking a ninth grader to read something that is at a tenth grade level is reasonable, perhaps, especially later in the school year. Asking an ELL who is reading at a 5th grade level, and who has a limited vocabulary in English, to read that same thing is not reasonable. Such a reading will not help the student learn the content nor will it help them learn English. Instead, we should be giving ELLs $i + 1$ ¹ readings. With an $i + 1$ reading, an ELL is much more likely to understand the reading, acquire the content, and hopefully learn some English.

Below are details on the readability and the vocabulary profile of actual readings given to students. As mentioned above, very often teachers assign readings that are well above what many ELLs can read and sometimes above the actual reading grade level of the mainstream students. This is not the fault of the teachers as much as it is the fault of the textbook and resource creators and publishers.

¹ $i + 1$ is Krashen's comb

Slave Trade Reading

The first example is from a social studies reading about the trans-Atlantic slave trade. Below is the first paragraph of the original reading. The full text is in the handout packet.

A system for trading slaves was created in many places. A slave trade was conducted up and down the Nile River in Africa at one point. The camel was brought to northern Africa from Arabia, allowing slave traders to establish routes through the Sahara Desert. Slaves were traded for perfumes, cloth, and spices, products that were rare in western Africa at the time.

The Flesh-Kincaid grade level for the entire reading is grade 9. The text was being used with 5th graders! Thus, the original is probably much too difficult even for many of the native English speaking students.

Most of the sentences (in the sample paragraph above) are in passive voice. Passive voice can be more difficult than active voice for language learners. Further, the author gives a lot of details, most of which will not be needed or even seen again in the reading. However, the author does not even explain what the word “slave” means.

Statistics

Group	Percent
Reading Ease	68 (standard)
Grade Level	9 (7.7–10.0)
Number of Sentences	44
Number of Words	701
Ave. Words per Sentence	16

Group	Percent
Ave. Syllables per Word	1

Table 3.1: Statistics on the original reading.

Vocab Profile

A vocabulary profile shows how common the words used in the reading are. In theory, ELLs are more likely to know the most common words, and they will be more likely to struggle with uncommon words and perhaps words on the Academic Word List.

Group	Percent
0-1000	73.00
1001-2000	10.86
AWL	2.00
Offlist	14.14

Table 3.2: Vocab profile of original (unmodified) Slave Trade reading

Research shows that if more than about 3% of words in a reading are not known, understanding suffers significantly. When the number of off-list words is over 5% or so, the chances are good that understanding is going to suffer. In this reading, over 14% of the words are off list.

Off List Words

Below are all of the “off-list” words in the original reading, with the number of times that the word appeared in the reading in parentheses. Many of the

words only appear once. These words can probably be replaced. If they are important content area words, then they should be repeated in the reading.

Word	Word	Word
abolish (1)	europeans (5)	portugal (2)
africa (10)	exhaustion (1)	portuguese (1)
african (1)	fabrics (1)	prosperous (1)
alcohol (1)	filthy (1)	quakers (1)
america (2)	fleets (1)	raids (1)
americas (3)	france (1)	reloaded (1)
arabia (1)	goods (3)	resembled (1)
atlantic (3)	harsh (1)	sahara (1)
brazil (1)	immune (1)	spain (2)
british (1)	indians (2)	spanish (1)
camel (1)	indies (1)	spices (1)
captured (1)	inland (1)	transatlantic (1)
cargo (1)	jungles (1)	treaty (1)
caribbean (1)	mutiny (1)	triangle (1)
conducive (1)	navy (1)	tribal (1)
cuba (1)	nile (1)	utrecht (1)
destination (1)	opposition (1)	wilberforce (1)
england (3)	parliament (1)	william (1)
enslave (1)	perfumes (1)	
europe (5)	plantations (4)	
european (4)	ports (1)	

Rise of Big Business

This reading was used in a 7th grade social studies class—in September, not May. The title is “Chapter 25: The Rise of Industry”. The question just before the reading is “Did the benefits of industrialization outweigh the costs?”

The first two paragraphs of the original reading:

The tragedy began late in the afternoon on March 25, 1911. The quitting bell had just sounded at the Triangle Shirtwaist Factory in New York City, and nearly 500 employees, most of them young immigrant women, headed toward the exit. It was Saturday, and many were looking forward to a day off with family and friends.

One woman sniffed the air and smelled something burning! Another spotted flames leaping out of a pile of cloth scraps, but before she could react, the wooden table above the fabric was ablaze. The fire jumped to the patterns hanging above the table, causing flaming bits of paper and fabric to whirl around the room and set other tables on fire. The room filled with smoke, and the air became so hot that it burst the windows. Fresh air poured into the room, sending the flames even higher.

This reading is at a 9th grade level but, as mentioned, was given to 7th graders early in the school year. Even native English-speaking mainstream students may struggle with this reading. ELLs who are not reading at at least grade level will almost certainly struggle with it.

Vocab Profile

The vocabulary profile for this reading shows that only about 80% of the words are in the first 1,000 words and over 10% are off list.

Group	Percent
0-1000	79.07
1001-2000	4.92
AWL	4.56
Offlist	11.45

Table 3.4: Vocab profile of original (unmodified) Slave Trade reading

Off-List Words

Below are all of the “off-list” words in the original reading, with number of times appearing in parentheses. As with the previous reading, many of the words only appear once.

Word	Word	Word
ablaze (1)	entrepreneurs (1)	millionaires (1)
acre (2)	european (2)	overlaid (1)
alva (1)	exit (1)	palace (1)
amazing (1)	fabric (2)	protests (1)
american (4)	faire (4)	quitting (1)
americans (4)	favorable (1)	recalled (1)
antiques (1)	flocked (1)	reform (1)
armor (1)	french (1)	scraps (1)
assortment (1)	frontier (2)	shirtwaist (4)

Word	Word	Word
boom (2)	fueled (1)	showy (1)
booming (1)	gilded (3)	sniffed (1)
bureau (1)	glittering (1)	sparked (1)
bushels (1)	goods (5)	tapestries (1)
capitalists (1)	huge (1)	tariffs (1)
census (1)	imported (2)	tragedy (1)
clan (1)	industrialist (1)	triangle (4)
competitive (1)	industrialists (1)	twain (2)
congress (1)	industrialization (4)	vanderbilt (8)
continent (1)	jam (1)	vanderbilts (2)
cornelius (1)	kissam (1)	veritable (1)
corruption (1)	laborers (1)	wealthiest (1)
costumes (1)	laissez (4)	whirl (1)
decorations (1)	leaping (1)	william (1)
density (1)	leh (1)	wonderland (1)
dismal (1)	mansion (1)	york (4)
downturns (1)	marveled (1)	
dubbed (1)	marvels (1)	
elaborate (1)	medieval (1)	
elite (1)	midwest (1)	

Primary Document: “A Letter Opposing the British”

The next reading was used in a 9th grade world history class, near the middle of the first semester. It is a primary document, so some teachers did not want to change it in any way. That is certainly understandable, but my response

would be that if your goal is for students to get something out of it, you have to give them something they can handle. They can still understand the idea of a primary document even if you modify the actual document a bit.

The first paragraph below is the textbook introduction to the letter. The second paragraph is from the letter itself.

During British imperial rule in the 19th century, many Indians believed that the British were trying to force them to convert to Christianity. In a letter, Muslim leader Moulavy Syad Kutb Shah Sahib issued a warning to Hindus and Muslims in order to protect them from the British. The following excerpt from his letter reflects Indians' resentment toward the British because of religious differences. What course of action did Maulavy Syad Shah recommend Indians should take?

The English are people who overthrow all religions. You should understand well the object of destroying the religions of Hindustan; they have for along time been causing books to be written and circulated throughout the country by the hands of their priests, and, exercising their authority, have brought out numbers of preachers to spread their own tenets: this has been learned from one of their own trusted agents. . . .

Statistics

Group	Percent
Reading Ease	53.5 (fairly difficult)
Grade Level	13 (10.0–16.9)
Number of Sentences	25

Group	Percent
Number of Words	675
Ave. Words per Sentence	27
Ave. Syllables per Word	1.49

Table 3.6: Statistics on the original reading.

This reading is at a 13th(!) grade reading level. It was assigned to 9th graders. Many (Most?) English-speaking mainstream students will struggle with this reading. Many ELLs will almost certainly struggle with it.

Vocab Profile

Group	Percent
0-1000	78.75
1001-2000	5.35
AWL	2.08
Offlist	13.82

Table 3.7: Vocab profile of original “Letter Opposing the British”

Almost 14% of the words are off list. Many are names, of course, but should we really expect lower-level ELLs to deal with words such as “adjured”, “cartridges”, “mutiny”, and “slaughter”? A diligent student might waste all night with a dictionary. A more common student might just give up.

Off-List Words

Word	Word	Word
adjured (1)	gulled (1)	mussulman (1)
bahaduri (1)	heed (1)	mussulmans (3)
bareilly (1)	hereby (1)	mutiny (1)
brahmans (2)	herein (1)	overthrow (2)
british (4)	hindu (1)	resentment (1)
cartridges (1)	hindus (8)	sahib (2)
christianity (1)	hindustan (4)	saligrani (1)
circulated (1)	imperial (1)	sepoy (1)
coalesce (1)	indians (5)	shah (4)
compact (1)	infringe (1)	sins (1)
conviction (1)	kine (1)	slaughter (3)
deceit (1)	koran (1)	slay (2)
deceitful (1)	kutb (2)	syad (4)
engage (1)	loins (1)	tenets (1)
engagements (1)	mahomedan (1)	treachery (1)
excerpt (1)	mahomedans (1)	tulsi (1)
expedient (3)	maulavy (4)	utterly (1)
ganges (1)	muslim (2)	
gird (1)	muslims (1)	

The Third Issue: Formatting

In addition to readability and vocabulary, another issue that often causes difficulties for my students is formatting. Handouts are often printed with far too many words per line, with small fonts, and with small margins. These are the most common formatting issues, and as with the vocabulary and readability issues, we can address them to help students read successfully and

acquire the content successfully. The handouts packet has examples of some very user-*un*friendly readings.

Chapter 4

A Solution

A solution to the problems outlined above is to rewrite, and probably reformat, the original reading to be closer to the reading level of the ELLs (and perhaps some of the mainstream students). Another option, sometimes the easier one, is to create a new reading with the same basic content. Although I say “create”, usually I base new readings on a Creative Commons licensed work. This means that I can legally rewrite, copy, and share the “new” reading.

In the examples above, the content teacher gave me existing textbook readings or handouts. I had to get the text and then rewrite it to be more appropriate for the ELLs. Scanning and optical character recognition are beyond the scope of this presentation, but I am happy to help if you contact me.

Below are the data for the modified versions of the three readings we looked at earlier.

Slave Trade Reading

The first two paragraphs of the modified reading:

A slave is a person who is owned by someone else and is forced to work for no money. Slaves are not free to leave or change jobs. The “slave trade” is the buying and selling of slaves. In the past, slaves were traded in many places around the world.

In Africa, there was a slave trade on the Nile River. Slave traders even had routes going through the Sahara Desert. Slaves were traded for perfumes, cloth, and spices. These were rare in western Africa at the time.

I made more changes and added more content to this one than is typical. It was just too high level and had too much extraneous info.

The Flesch-Kincaid grade level of the modified reading is now at a 6th grade level, down from the original 9th grade level. Because it is for 5th graders, it is probably still too difficult. The truth is, I did not have much time to get this one finished. Close was better than nothing, because “nothing” means that the student gets stuck with the original, unmodified, reading. Obviously, the earlier you can start working on a reading, the better.

However, a look at the statistics and vocab profile show that this is a much more accessible reading.

Statistics

Group	Percent
Reading Ease	75.8 (fairly easy)
Grade Level	6 (5.2–8.0)
Number of Sentences	62
Number of Words	695
Ave. Words per Sentence	11
Ave. Syllables per Word	1.0

Group	Percent
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Table 4.1: Statistics on the modified reading.

The modified reading is much easier, now at about a sixth grade reading level, and as we will see below, has a much better vocabulary profile.

Vocab Profile

Group	Percent	Change
0-1000	74.60	+1.60
1001-2000	11.97	+1.11
AWL	1.90	-0.10
Offlist	11.53	-2.61

Table 4.2: Vocab profile of modified Slave Trade reading, showing % change from original.

Off-List Words

Below are all of the “off-list” words in the modified reading, with the number of times the word appears in the reading in parentheses. Overall, there are far fewer of them, and a higher percentage of them are content area words that teachers are likely using fairly frequently in class. Either the content area teacher or the ESL teacher would hopefully pre-teach the most important of these words.

Word	Word	Word
africa (10)	cuba (1)	nile (1)

Word	Word	Word
african (1)	england (2)	perfumes (1)
africans (1)	europa (8)	plantations (3)
alcohol (1)	european (2)	portugal (2)
america (1)	europeans (10)	quakers (1)
americans (3)	france (1)	sahara (1)
americas (13)	goods (1)	spain (2)
atlantic (1)	immune (1)	spices (1)
captured (1)	indies (1)	triangle (3)
cola (1)	navy (2)	usa (1)

Rise of Big Business

This modified reading is incomplete—I did not have time to finish before the teacher completed the reading and moved on. The length of the original and the speed that the class went through it worries me, to be honest. There was no time for ELLs to even try to make sense of it. The important take away is that we need to get readings from teachers as far ahead of time as possible.

I did get about 4 pages completed, so have included the statistics and such here. The first few paragraphs of the modified reading:

On March 25, 1911, a fire started in the Triangle Shirtwaist Factory in New York City. Almost 500 employees, most of them young immigrant women, worked in the factory. The fire spread to the tables and then to the walls. The room filled with smoke, and the air became very hot. Windows broke. Air came into the room from the broken windows. This air made the fire stronger.

The young women tried to leave, but some doors were locked, and some doors were blocked by boxes. They could not get out.

“I heard somebody cry, ‘Fire!’ I . . . ran for the door,” [said] one woman. “The door was locked and immediately there was a [big group] of girls before it.” She could see at once that “if we couldn’t get out, we would all [die].”

Statistics

Group	Percent
Reading Ease	63 (standard)
Grade Level	8 (6.6–10.0)
Number of Sentences	41
Number of Words	488
Ave. Words per Sentence	12
Ave. Syllables per Word	2

Table 4.4: Statistics on the modified reading.

The statistics show that this is a much easier reading, even though it is still a bit above grade level.

Vocab Profile

Group	Percent	Change
0-1000	87.84	+8.77
1001-2000	3.51	+1.41
AWL	2.27	-2.29
Offlist	6.39	-5.56

Group	Percent	Change
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Table 4.5: Vocab profile of modified reading, showing % change from original.

Off-List Words

An important change is that there are far fewer non-content words on the off-list word list. Granted, this is based on a shorter reading (just the four modified pages), but the goal is the same—to remove as many non-essential off-list words as possible.

Word	Word	Word
american (1)	americans (2)	cornelius (1)
entrepreneurs (1)	faire (3)	french (1)
industrialization (5)	laissez (3)	outweigh (1)
shirtwaist (3)	triangle (3)	vanderbild (2)
vanderbilts (2)	york (2)	

Primary Document: “A Letter Opposing the British”

Below are the first two paragraphs of the modified letter. As before, the first is the textbook introduction, the second is from the letter itself.

This is actually the second modified version I did. I redid it to make it lower level for a new ELL who was reading at a very low level.

During British imperial rule in the 19th century, many Indians believed that the British were trying to force them to give up their religion and become Christian. In a letter, Muslim leader Moulavy Syad Kutb Shah Sahib warned Hindus and Muslims about the British. The following excerpt[1] from his letter shows Indians' anger toward the British because of religious differences. What course of action did Moulavy Syad Shah recommend Indians should take?

The English are Christians and they work against all other religions. They want to destroy the religions of India. For a long time, English priests have been passing around pro-Christian books throughout the country. They also have preachers spreading the Christian religion. We learned this from one of their people.

Statistics

Group	Percent
Reading Ease	69.9 (fairly easy)
Grade Level	7 (6.7–8.3)
Number of Sentences	39
Number of Words	576
Ave. Words per Sentence	15
Ave. Syllables per Word	1

Table 4.7: Statistics on the modified reading.

Vocab Profile

The vocabulary profile has not changed much; most of the change came from reducing the off-list words and increasing the words from the first category.

Group	Percent	Change
0-1000	83.10	+4.35
1001-2000	5.23	-0.13
AWL	1.39	-0.69
Offlist	10.28	-3.54

Table 4.8: Vocab profile of modified reading, showing % change from original.

Off-List Words

An important change is that there are far fewer non-content words on the off-list word list. Most of the off-list words are content-area words. Granted, this is based on a shorter reading (just the four modified pages), but the goal is the same—to remove as many non-essential off-list words as possible.

Word	Word	Word
british (4)	hindu (2)	muslim (4)
bullets (1)	hindus (9)	muslims (6)
cheaters (1)	imperial (1)	mutiny (1)
christian (3)	india (4)	pro (1)
christians (1)	indians (5)	sahib (1)
excerpt (1)	kutb (1)	sepoy (1)
hindi (1)	moulavy (3)	shah (3)
		syad (3)

Some Caveats

So far, I have assumed that the students are expected to read the content mostly by themselves. When this is not the case, the issues with vocabulary and reading level may not be as serious.

Close Reading

Ninth graders can successfully read a college-level reading, *if* the teacher prepares properly and teaches the reading actively and intentionally. Sometimes, for example, a teacher will have a difficult reading that they fully intend to spend one or even more class periods “close reading” together with the students.

Or, a teacher may assign a reading to be done in a group. With thoughtful grouping, students may be able to help each other make sense of a more difficult reading.

In these cases, my advice is still to look at the reading level and vocabulary profile of the reading. With that information, the teacher, perhaps with help from an ESL teacher, can decide which words to modify or pre-teach and which sentence structures maybe aren't worth the class or group time.

$i + 1$

If we are not planning on doing close reading with students, we need to remember that we will usually want to give them $i + 1$ readings. That means giving them something just a little bit beyond where they can comfortably read. But, we also need to be aware of the difficulty of the content. Most likely, the more mental energy students use to decode the reading, the less they will have available for understanding the content of the reading.

Chapter 5

The Process

Step by Step

Below are the steps I go through when rewriting, or creating, a reading. Even if the “original” is something from simple.wikipedia.org, I would still run it through a readability and vocabulary checker.

1. Get text of the “original”
 - get digital file from content teacher
 - if no digital file, scan original and do Optical Character Recognition (OCR)
 - Simple Wikipedia
 - Wikipedia
 - other Open Educational Resources (OER)
 - or, create by yourself from scratch (last resort!)
2. Check vocabulary and grade level of the original
 - Grades 7-12: LexTutor Classic Vocab Profiler

- Grades k-6: LexTutor Kids Vocab Profiler
 - ReadabilityFormulas.com
 - built into some word processors (in MS Outlook and MS Word)
3. Reduce vocabulary to target level
 - different, “easier”, word
 - remove or replace as much non-content area off-list vocabulary as possible
 - rewrite or remove slang, idioms, other language that students might struggle with
 - add definitions—in footnotes or in text
 4. Lower reading difficulty of the passage (readability statistics)
 - change a long sentence into 2 or 3 shorter ones
 - replace long, multi-syllable words when possible, *especially if off-list*
 5. Continue lowering reading difficulty of the passage (for English Learners)
 - change passive voice to active
 - check that pronouns are clear, replace with noun if needed
 - rewrite bad writing to be clearer (*surprisingly common*, unfortunately)
 - remove extraneous information as necessary
 - what is the most important information? Keep that.
 - everything else can be cut or simplified if need be
 6. Repeat steps 2 through 5 until the reading is at the level your students need.
 7. Add images, charts, other graphics. Wikipedia is a great source.

8. Want to translate into another language? Now would be a good time.

- Google Translate is currently the best, I think.

9. Modify Formatting

- increase font size—I like 13pt or 14pt for lower- and mid-level ELLs
- use a literacy font, if appropriate. SIL Andika is very good.
- increase margins / reduce amount of text on each line
- increase line spacing

Resources

Free / Open Content

CK-12 free, open, customizable content area ebooks

Simple Wikipedia Wikipedia articles written for younger readers and English Learners. Great resource and usually my first stop when starting a new article.

Wikipedia When Simple Wikipedia does not have an article, or they do but it is not detailed enough, regular Wikipedia can be an acceptable second choice. Often the introduction / summary (the text before the table of contents) is all you need to get started on a new reading.

Rewordify web site that replaces words with “simpler” ones. Usually worth at least trying. I’ve not always had great results. The site does have lots of useful features for teachers as well as some interactive features that students might find useful. Their terms of service seem reasonable, and it looks like they maybe don’t try to claim ownership of the “rewordified” texts. But, I am not a lawyer.

Readability Tests and Vocabulary Data

LexTutor LexTutor looks like it was designed in the 1990s, but it has many very powerful tools.

LexTutor Classic Vocab Profiler the “Classic” profiler shows results for:

- the first 1,000 most common word families
- the second 1,000 most common word families
- words on the Academic Word List (AWL)
- words that are not in any of the first three categories

LexTutor Kids Vocab Profiler the “Kids” profiler shows results in 250 word groups (instead of 1,000).

ReadabilityFormulas.com Great site because they run your text through several of the most popular readability formulas and give you a “consensus” opinion. Note that some sites also look at the words in addition to the actual math formulas. That is, they have lists of “hard” words and consider those in their final score. This is one reason that different sites or software can give different results for the same texts.

Readable - Free Readability Test Tool Another readability testing site. I’m not sure who “webpagefx.com” are, but this page is cleaner than the ReadabilityFormulas.com site. However, this site also gives less information than ReadabilityFormulas.com. Results from both sites are close enough that either would be fine for checking reading levels.

My Website

I have a wiki with many of the modified readings I have already done. It is at: https://www.osugisakae.com/tesol-wiki/index.php?title=Main_Page. Please consider joining and adding your own modified readings.

Appendix A

Readability Formulas

The Flesch Reading Ease Formula

The Flesch Reading Ease score is not related to grade level but indicates how difficult to read a passage might be. Readings with higher scores are *easier* to read.

The formula for the score is:

$$206.835 - 1.015 \times \frac{\text{totalwords}}{\text{totalsentences}} - 84.6 \times \frac{\text{totalsyllables}}{\text{totalwords}}$$

Scores can be interpreted as shown in the table below.¹

Score	School level	Notes
100.00-90.00	5th grade	Very easy to read. Easily understood by an average 11-year-old student.
90.0-80.0	6th grade	Easy to read. Conversational English for consumers.
80.0-70.0	7th grade	Fairly easy to read.

¹Flesch, Rudolf. "How to Write Plain English". University of Canterbury.

Score	School level	Notes
70.0–60.0	8th & 9th grade	Plain English. Easily understood by 13- to 15-year-old students.
60.0–50.0	10th to 12th grade	Fairly difficult to read.
50.0–30.0	College	Difficult to read.
30.0–0.0	College graduate	Very difficult to read. Best understood by university graduates.

The Flesch-Kincaid Grade Level Formula

$$0.39 \times \frac{\text{TotalWords}}{\text{TotalSentences}} + 11.8 \times \frac{\text{TotalSyllables}}{\text{TotalWords}} - 15.59$$

The result is an approximate USA grade level for the reading.

Unfortunately, the Flesch reading ease and the Flesch-Kincaid Grade Level formulas cannot be compared or converted. Best to look at both as you modify or create readings.

Gunning Fog Index

$$0.4 \times \left(\frac{\text{Words}}{\text{Sentences}} + 100 \times \frac{\text{ComplexWords}}{\text{Words}} \right)$$

The result is a number approximating the grade level difficulty of the reading.

The Gunning Fog index tries to take word difficulty into account by looking at “complex” words. These are just words with three or more syllables but, names, jargon, grammatical suffixes, and the such are ignored when calculating the Gunning Fog index.

Coleman-Liau Readability Formula

The Coleman-Liau formula (also called the Coleman-Liau Index) depends on the number of characters, and was made with automated checking in mind. They look at the average number of characters per 100 words and the average number of sentence per 100 words. The result is a USA grade level for the reading.

$$0.0588 \times L - 0.296 \times (S - 15.8)$$

L is the average number of characters per 100 words.

S is the average number sentences per 100 words.

Sources

https://en.wikipedia.org/wiki/Flesch-Kincaid_readability_tests

https://en.wikipedia.org/wiki/Gunning_fog_index

<http://www.readabilityformulas.com/coleman-liau-readability-formula.php>

https://en.wikipedia.org/wiki/Coleman-Liau_index