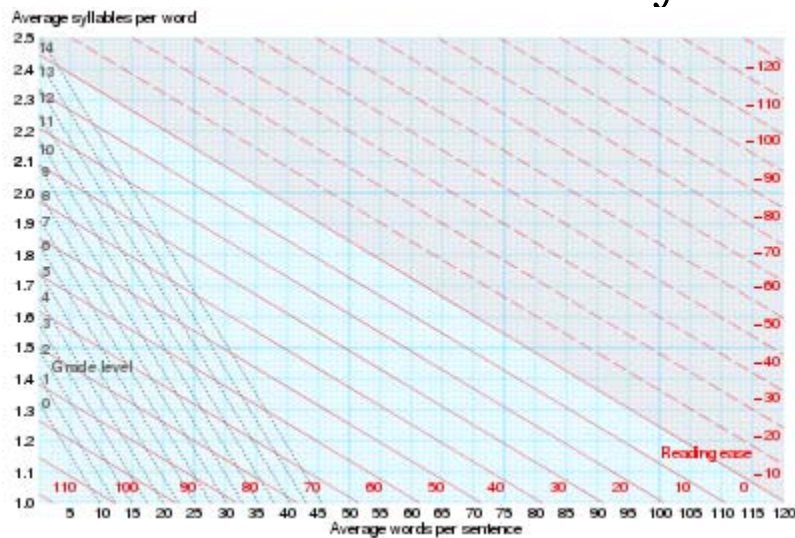# Flesch–Kincaid readability tests

Graphs of Flesch-Kincaid reading ease (red) and grade level (gray) scores against average syllables per word and average words per sentence

The **Flesch–Kincaid readability tests** are readability tests designed to indicate how difficult a passage in English is to understand. There are two tests: the Flesch Reading-Ease, and the Flesch–Kincaid Grade Level. Although they use the same core measures (word length and sentence length), they have different weighting factors.

The results of the two tests correlate approximately inversely: a text with a comparatively high score on the Reading Ease test should have a lower score on the Grade-Level test. Rudolf Flesch devised the Reading Ease evaluation; somewhat later, he and J. Peter Kincaid developed the Grade Level evaluation for the United States Navy.

Flesch reading ease[edit]

In the Flesch reading-ease test, higher scores indicate material that is easier to read; lower numbers mark passages that are more difficult to read. The formula for the Flesch reading-ease score (FRES) test is:[7]

Scores can be interpreted as shown in the table below.[7]

Score	School level (US)	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.
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.
30.0–10.0	College graduate	Very difficult to read. Best understood by university graduates.
10.0–0.0	Professional	Extremely difficult to read. Best understood by university graduates.

Reader's Digest magazine has a readability index of about 65, *Time* magazine scores about 52, an average grade six student's written assignment (age of 12) has a readability index of 60–70 (and a reading grade level of six to seven), and the *Harvard Law Review* has a general readability score in the low 30s. The highest (easiest) readability score possible is 121.22, but only if every sentence consists of only one one-syllable word. "The cat sat on the mat." scores 116. The score does not have a theoretical lower bound; therefore, it is possible to make the score as low as wanted by arbitrarily including words with many syllables. The sentence "This sentence, taken as a reading passage unto itself, is being used to prove a point." has a readability of 69. The sentence "The Australian platypus is seemingly a hybrid of a mammal and reptilian creature." scores 37.5 as it has 24 syllables and 13 words. While Amazon calculates the text of *Moby-Dick* as 57.9,[8] one particularly long sentence about sharks in chapter 64 has a readability score of −146.77.[9] One sentence in the beginning of *Swann's Way*, by Marcel Proust, has a score of −515.1.[10]

The U.S. Department of Defense uses the reading ease test as the standard test of readability for its documents and forms.[11] Florida requires that insurance policies have a Flesch reading ease score of 45 or greater.[12][13]

Use of this scale is so ubiquitous that it is bundled with popular word processing programs and services such as KWord, IBM Lotus Symphony, Microsoft Office Word, WordPerfect, WordPro, and Grammarly.

Polysyllabic words affect this score significantly more than they do the grade-level score.

Flesch–Kincaid grade level[edit]

These readability tests are used extensively in the field of education. The "Flesch–Kincaid Grade Level Formula" presents a score as a U.S. grade level, making it easier for teachers, parents, librarians, and others to judge the readability level of various books and texts. It can also mean the number of years of education generally required to understand this text, relevant when the formula results in a number greater than 10. The grade level is calculated with the following formula:[14]

The result is a number that corresponds with a U.S. grade level. The sentence, "The Australian platypus is seemingly a hybrid of a mammal and reptilian creature" is an 11.3 as it has 24 syllables and 13 words. The different weighting factors for words per sentence and syllables per word in each scoring system mean that the two schemes are not directly comparable and cannot be converted. The grade level formula emphasizes sentence length over word length. By creating one-word strings with hundreds of random characters, grade levels may be attained that are hundreds of times larger than high school completion in the United States. Due to the formula's construction, the score does not have an upper bound.

The lowest grade level score in theory is −3.40, but there are few real passages in which every sentence consists of a single one-syllable word. *Green Eggs and Ham* by Dr. Seuss comes close, averaging 5.7 words per sentence and 1.02 syllables per word, with a grade level of −1.3. (Most of the 50 used words are monosyllabic; "anywhere", which occurs eight times, is the only exception.)

Limitations[edit]

As readability formulas were developed for school books, they demonstrate weaknesses compared to directly testing usability with typical readers. They neglect between-reader differences and effects of content, layout and retrieval aids.[15] For example, the pangram "Cwm fjord-bank glyphs vext quiz." has a reading ease score of 100 and grade level score of 0.52 despite its obscure words.

References[edit]

1. ^ Kincaid, J.P., Fishburne, R.P., Rogers, R.L., & Chissom, B.S. (1975). Derivation of new readability formulas (automated readability index, fog count, and flesch reading ease formula) for Navy enlisted personnel. Research Branch Report 8–75. Chief of Naval Technical Training: Naval Air Station Memphis.
2. ^ *Kincaid JP, Braby R, Mears J (1988). "Electronic authoring and delivery of technical information". Journal of Instructional Development. **11** (2): 8–13. doi:10.1007/bf02904998. S2CID 62551107.*
3. ^ Jump up to:ª ᵇ *McClure G (1987). "Readability formulas: Useful or useless. (an interview with J. Peter Kincaid.)". IEEE Transactions on Professional Communication. **30**: 12–15. doi:10.1109/TPC.1987.6449109. S2CID 13157772.*
4. ^ *Kincaid JP, Braby R, Wulfeck WH II (1983). "Computer aids for editing tests". Educational Technology. **23**: 29–33.*

5. **^** *Braby R, Kincaid JP, Scott P, McDaniel W (1982). "Illustrated formats to teach procedures". IEEE Transactions on Professional Communication. 25 (2): 61–66. doi:10.1109/TPC.1982.6447756. S2CID 30615819.*

6. **^** *Kincaid JP, Aagard JA, O'Hara JW, Cottrell LK (1981). "Computer Readability Editing System". IEEE Transactions on Professional Communication. 24 (1): 38–42. doi:10.1109/TPC.1981.6447821. S2CID 39045053.* (also reported in Aviation Week and Space Technology, January 11, 1982, pp. 106–107.)

7. ^ Jump up to:*a b* *Flesch, Rudolf. "How to Write Plain English". University of Canterbury. University of Canterbury. Archived from the original on July 12, 2016. Retrieved July 12, 2016.*

8. **^** *Gabe Habash (July 20, 2011). "Book Lies: Readability is Impossible to Measure". Archived from the original on May 21, 2014.*

9. **^** Melville, Herman. "Chapter 64: Stubb's Supper." Moby-Dick. Lit2Go Edition. 1851. Web. <http://etc.usf.edu/lit2go/42/moby-dick/745/chapter-64-stubbs-supper/>. August 16, 2013.

   "Though amid all the smoking horror and diabolism of a sea-fight, sharks will be seen longingly gazing up to the ship's decks, like hungry dogs round a table where red meat is being carved, ready to bolt down every killed man that is tossed to them; and though, while the valiant butchers over the deck-table are thus cannibally carving each other's live meat with carving-knives all gilded and tasselled, the sharks, also, with their jewel-hilted mouths, are quarrelsomely carving away under the table at the dead meat; and though, were you to turn the whole affair upside down, it would still be pretty much the same thing, that is to say, a shocking sharkish business enough for all parties; and though sharks also are the invariable outriders of all slave ships crossing the Atlantic, systematically trotting alongside, to be handy in case a parcel is to be carried anywhere, or a dead slave to be decently buried; and though one or two other like instances might be set down, touching the set terms, places, and occasions, when sharks do most socially congregate, and most hilariously feast; yet is there no conceivable time or occasion when you will find them in such countless numbers, and in gayer or more jovial spirits, than around a dead sperm whale, moored by night to a whaleship at sea."

10. **^** Proust, Marcel. "Swann's Way." *In Search of Lost Time*. 2004. web. March 21, 2014.

    "But I had seen first one and then another of the rooms in which I had slept during my life, and in the end I would revisit them all in the long course of my waking dream: rooms in winter, where on going to bed I would at once bury my head in a nest, built up out of the most diverse materials, the corner of my pillow, the top of my blankets, a piece of a shawl, the edge of my bed, and a copy of an evening paper, all of which things I would contrive, with the infinite patience of birds building their nests, to cement into one whole; rooms where, in a keen frost, I would feel the satisfaction of being shut in from the outer world (like the sea-swallow which builds at the end of a dark tunnel and is kept warm by the surrounding earth), and where, the fire keeping in all night, I would sleep wrapped up, as it were, in a great cloak of snug and savoury air, shot with the glow of the logs which would break out again in flame: in a sort of alcove without walls, a cave of warmth dug out of the heart of the room itself, a zone of heat whose boundaries were constantly shifting and altering in temperature as gusts of air ran across them to strike freshly upon my face, from the corners of the room, or from parts near the window or far from the fireplace which had therefore remained cold—or rooms in summer, where I would delight to feel myself a part of the warm evening, where the moonlight striking upon the half-opened shutters would throw down to the foot of my bed its enchanted ladder; where I would fall asleep, as it might be in the open air, like a titmouse which the breeze keeps poised in the focus of a sunbeam—or sometimes the Louis XVI room, so cheerful that I could never feel really unhappy, even on my first night in it: that room where the slender columns which lightly supported its ceiling would part, ever so gracefully, to indicate where the bed was and to keep it separate; sometimes again that little room with the high ceiling, hollowed in the form of a pyramid out of two separate storeys, and partly walled with mahogany, in which from the first moment my mind was drugged by the unfamiliar scent of flowering grasses, convinced of the hostility of the violet curtains and of the insolent indifference of a clock that chattered on at the top of its voice as though I were not there; while a strange and pitiless mirror with square feet, which stood across one corner of the

room, cleared for itself a site I had not looked to find tenanted in the quiet surroundings of my normal field of vision: that room in which my mind, forcing itself for hours on end to leave its moorings, to elongate itself upwards so as to take on the exact shape of the room, and to reach to the summit of that monstrous funnel, had passed so many anxious nights while my body lay stretched out in bed, my eyes staring upwards, my ears straining, my nostrils sniffing uneasily, and my heart beating; until custom had changed the colour of the curtains, made the clock keep quiet, brought an expression of pity to the cruel, slanting face of the glass, disguised or even completely dispelled the scent of flowering grasses, and distinctly reduced the apparent loftiness of the ceiling."

11. ^ *Luo Si; et al. (November 5–10, 2001). A statistical model for scientific readability. Atlanta, GA, USA: CIKM '01.*

12. ^ *"Florida Statute § 627.4145". Retrieved March 20, 2020.*

13. ^ "Readable Language in Insurance Policies"

14. ^ *Kincaid JP, Fishburne RP Jr, Rogers RL, Chissom BS (February 1975). "Derivation of new readability formulas (Automated Readability Index, Fog Count and Flesch Reading Ease Formula) for Navy enlisted personnel" (PDF). Research Branch Report 8-75, Millington, TN: Naval Technical Training, U. S. Naval Air Station, Memphis, TN. Archived (PDF) from the original on December 10, 2020.*

15. ^ J. Redish, *Readability formulas have even more limitations than Klare discusses*, August 2000, ACM Journal of Computer Documentation 24(3):132-137, DOI:10.1145/344599.344637

Further reading[edit]

- *Flesch R (1948). "A new readability yardstick". Journal of Applied Psychology. 32 (3): 221–233. doi:10.1037/h0057532. PMID 18867058.*

- *Farr JN, Jenkins JJ, Paterson DG (October 1951). "Simplification of Flesch Reading Ease Formula". Journal of Applied Psychology. 35 (5): 333–337. doi:10.1037/h0062427.*

\#