

# Readability Measures

## Other Textual Measures

### Readability Measures

**Flesch Reading Ease** The Flesch Reading Ease test measures how easy a text is to read. Higher scores indicate material that is easier to read, while lower scores suggest more challenging passages. The formula for calculating the Flesch Reading Ease Score (FRES) is:

$$\text{Flesch Reading Ease} = 106.835 - 1.015 \left( \frac{\text{total words}}{\text{total sentences}} \right) - 84.6 \left( \frac{\text{total syllables}}{\text{total words}} \right)$$

Score	School Level	Notes
100.00–90.00	5th Grade	Very easy to read. Easily understood by an average 11-year-old student.
90.00–80.00	6th Grade	Easy to read. Conversational English for consumers.
80.00–70.00	7th Grade	Fairly easy to read.
70.00–60.00	8th & 9th Grade	Plain English. Easily understood by 13- to 15-year-old students.
60.00–50.00	10th to 12th Grade	Fairly difficult to read.
50.00–30.00	College	Difficult to read.
30.00–10.00	College Graduate	Very difficult to read. Best understood by university graduates.
10.00–0.00	Professional	Extremely difficult to read. Best understood by university graduates.

**Flesch-Kincaid Grade Level** The Flesch-Kincaid Grade Level formula provides a score that corresponds to a U.S. grade level. This helps in assessing the readability of texts for different educational levels. The formula is:

$$\text{Flesch-Kincaid Grade Level} = 0.39 \left( \frac{\text{total words}}{\text{total sentences}} \right) + 11.8 \left( \frac{\text{total syllables}}{\text{total words}} \right) - 15.59$$

**Gunning Fog Index** The Gunning Fog Index estimates the number of years of formal education required to understand the text on first reading. For example, a fog index score of 12 suggests the text is suitable for a U.S. high school senior. The formula is:

$$\text{Fog Index} = 0.4 \left( \frac{\text{words}}{\text{sentences}} + 100 \left( \frac{\text{complex words}}{\text{words}} \right) \right)$$

Fog Index	Reading Level by Grade
17	College Graduate
16	College Senior
15	College Junior
14	College Sophomore
13	College Freshman
12	High School Senior
11	High School Junior
10	High School Sophomore
9	High School Freshman
8	Eighth Grade
7	Seventh Grade
6	Sixth Grade

**Coleman-Liau Index** The Coleman-Liau Index assesses text readability by estimating the U.S. school grade level needed to understand the text. The formula is:

$$CLI = 0.0588 \cdot L - 0.296 \cdot S - 15.8$$

where  $L$  is the average number of letters per 100 words and  $S$  is the average number of sentences per 100 words.

**Automated Readability Index** The Automated Readability Index (ARI) estimates the U.S. grade level required to understand a text. The formula is:

$$ARI = 4.71 \left( \frac{\text{characters}}{\text{words}} \right) + 0.5 \left( \frac{\text{words}}{\text{sentences}} \right) - 21.43$$

In this formula, “characters” refers to the total number of letters and numbers, “words” is the total number of spaces between words, and “sentences” is the number of sentences. Non-integer scores are rounded up to the nearest whole number.

**Dale-Chall Readability** The Dale-Chall readability formula quantifies the comprehension difficulty of a text based on a list of familiar words. The formula is:

$$\text{Dale-Chall Readability Score} = 0.1579 \left( \frac{\text{difficult words}}{\text{words}} \right) \times 100 + 0.0496 \left( \frac{\text{words}}{\text{sentences}} \right)$$

Score	Notes
4.9 or lower	Easily understood by an average 4th-grade student or lower.
5.0–5.9	Easily understood by an average 5th- or 6th-grade student.
6.0–6.9	Easily understood by an average 7th- or 8th-grade student.
7.0–7.9	Easily understood by an average 9th- or 10th-grade student.
8.0–8.9	Easily understood by an average 11th- or 12th-grade student.
9.0–9.9	Easily understood by an average college student.