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Appendix 1: Summary of Readability Formulae

Readability Test	Score Type	Description	Formula
Flesch-Kincaid Reading Grade Level	Grade Level	Designed for technical documents as part of the Kincaid Navy Personnel collection of tests. Applicable to broad array of disciplines.	$G = (11.8 \times (B/W)) + (0.39 \times (W/S)) - 15.59$
Flesch Reading Ease Score	Index Score (0-100)	The standard test used by many US government agencies. Originally designed to newspaper readability. Best suited to school textbooks and technical documents. Scored from 0-100, with higher scores indicating easier readability.	$I = (206.835 - (84.6 \times (B/W)) - (1.015 \times (W/S)))$
The Raygor Estimate	Grade Level	Designed for most text, including literature and technical documents	Calculated using the mean number of sentences and long words (≥ 6 characters) per 100 words, which are plotted on to a RE Graph, where their intersection determines RGL.
Fry	Grade Level	Designed for most texts, including technical documents and literature, across a range of levels, from primary school to university level. Best suited to educational texts.	Calculated using the mean number of sentences and syllables per 100 words, which are plotted on to a Fry Graph, where their intersection determines RGL.
SMOG	Grade Level	Assesses for 100% comprehension, whereas most formulae test for roughly 50%-75% comprehension. Applicable to secondary age (4th grade to college) level texts. Most accurate when applied to documents ≥ 30 sentences in length.	$G = 1.0430 \times \sqrt{C} + 3.1291$
Coleman-Liau	Grade Level	Suited to numerous disciplines. Most suited to secondary age (4th grade to college) level materials. Formula is based on text from the .4 to 16.3 grade level range.	$G = (-27.4004 \times (E/100)) + 23.06395$
FORCAST	Grade Level	The only test not designed for running narrative. Developed to assess US army technical manuals and forms.	$G = 20 - (M/10)$

Gunning Fog	Grade	Applicable to numerous disciplines. Originally designed for American businesses to improve the readability of their	$G = 0.4 \times (W/S + ((C^*/W) \times 100))$
	Level	writing.	

G=Grade level; B= Number of syllables; W= Number of words; S= Number of sentences; RGL= Reading Grade Level; I= Flesch Index Score; RE= Raygor Estimate; SMOG= Simple Measure of Gobbledygook; C= Complex words (≥ 3 syllables); E =predicted Cloze percentage= $141.8401 - (0.214590 \times \text{number of characters}) + (1.079812 \times S)$; M= Number of monosyllabic words; C*= Complex words with exceptions including, proper nouns, words made 3 syllables by addition of "ed" or "es", compound words made of simpler words

Appendix 2: All 'Wordy' Items with Suggested Alternatives Produced by Readability Studio Software

Wordy Items	Suggestion
A great deal of	Much, Vast
A large number of	Numerous, Many
A number of	A few
A reasonable amount of time	Quickly, Swiftly, Shortly
A wide range of	Assorted, Extensive, Numerous
Abdomen	Belly, Stomach
Ability	Skill
Abrasions	Scratches
Absolutely	Wholly
Abundant	Enough
Academy	School
Accelerate	Hasten, Quicken
Acceptable	Welcome
Accessible	Easy to reach
Accommodate	Adjust, Adapt, Fit
Accompany	Go with
Accomplish	Do, Carry out
Accurate	Correct, Exact
Achieve	Do, Make
Acquired	Gained, Got
Actual	Real
Actually	Really

Adapt	Make fit
Additional	Added, Extra
Adequate	Enough
Adjacent	Next to
Adjustment	Settlement
Administer	Manage
Advise	Tell, Recommend
Advocate	Speak for
Aggravate	Provoke
Aggregates	Collects
Aggressive	Forward, Strong, Attacking
Alleviate	Make easier
Almost all	Most
Alterations	Changes
Alternative	Choice
Amorphous	Shapeless
Amplified	Made greater
Amputated	Cut off
Analysis	Review, Breakdown, Exam, Study
Anterior	Front
Anticipating	Expecting, Awaiting
Anxiety	Fear
Apex	Tip
Apparent	Clear, Plain
Appear	Seem, Come
Appropriate	Proper (adj.), Set aside (verb)

Approximately	About
Are afraid of	Fears
Are consistent with	Cohere to, Conform with
As a result of	Because of, Due to, Following
Assent	Agree
Assist	Aid, Help
At a later date	Later
At all times	Always
At present	Now, Today
At the time	When
At this time	Now, Right now
Atrophy	Waste away
Attempt	Try
Available	Offered, Ready
Beneficial	Helpful
Benefit	Help
Bilateral	Two-sided
Capabilities	Abilities
Capable	Able
Capacity	Ability, Power, Position
Categories	Classes, Groups
Categorize	Class, Group
Characteristic	Trait
Characterized	Described
Coalition	Joining, Union
Collection	Mass, Heap

Combination of the two	Both of them
Combine	Join
Commitment	Pledge
Compensate	Pay
Complying	Following
Component	Part
Composed	Made up, Created, Calm (adj.)
Compress	Squeeze
Conception	Thought, Idea, Creation
Concerning	About, On, Worrying
Conclusion	Close, End
Conclusive	Final
Concussion	Shock
Congenital	Inborn
Consequences	Results
Consequently	So
Consolidation	Collection, Solidification
Constantly	Always
Contain	Have, Hold
Contaminated	Tainted
Continue	Keep, Keep on
Continue to be	Remain
Contribute	Give, Help
Contusions	Bruises
Course of action	Course, Direction, Plan
Create	Make

Criteria	Requirements
Definitive	Final
Demonstrate	Show
Dense	Thick
Desired	Wished
Determine	Decide, Figure
Develop	Make, Grow
Difficult	Hard
Difficulty	Trouble
Discontinue	Drop, Stop
Discover	Find out
Disrupt	Interrupt, Confuse
Distinguish	Tell apart
Draw attention to	Announce, Mention, Point out
Duplicate	Copy
During the course of	While, During, For, In, Over, Throughout, When, With
During the time	While, During, For, In, Over, Throughout, When, With
Eccentric	Odd, Off-centre
Educators	Teachers
Elevate	Raise, Lift up
Eliminated	Cut, Dropped
Encounter	Meet
Encourage	Urge
Enormous	Large, Huge

Ensure	Make sure
Establish	Set up, Prove
Evaluate	Check, Rate
Evident	Clear
Examine/ examination	Check
Exhibits	Shows
Explain	Show, Tell
External	Outer
Facilitate	Ease, Help
Final	Last
Frequently	Often
From start to finish	Completely, Thoroughly
Function	Act, Role
General public	Public
Give rise to	Cause, Lead to, Result in
Have an effect on	Affect, Influence
Have the ability to	Can
Have to do with	Deals with
Hesitate	Pause
Heterogeneous	Varied
Identification	I.D.
Identify	Name, Find
If this is the case	If so
Immediately	At once, Right away, Right now
Impact	Affect, Hit, Change
Impair	Harm, Weaken, Reduce

Implementation	Carrying out
In an effort to	To
In association with	Along with, As well as
In certain cases	At times, Sometimes
In conjunction with	Along with, And, Combined with, Coupled with, Joined with, Paired with, With
In many cases	Mostly, Most of these, Often
In response to	Because of
In some cases	At times, Sometimes
In some situations	At times, Sometimes
In spite of	Aside, Despite, Although
In terms of	As for
In the first place	First of all, First
In the meantime	Meantime
In the middle of	Amid, In between
In the opposite direction	Against
In the right	Correct, Right, Justified
In the wrong	Incorrect, Mistaken, Wrong
In their entirety	The entire
Inactive	Idle
Incision	Cut
Incomplete	Partial
Inconvenience	Bother
Incorporates	Blends, Joins, Mixes
Indicate	Show
Indication	Clue, Sign

Individual	Person, Single
Infrequently	Rarely
Initial	First
Insufficient	Not enough
Internal	Inner, Inside
Invaluable	Priceless
Investigate	Review, Check, Look over
Is able to	Can
Is dependent on	Depends on, Hinges on
It is important that	Must, Should
It is possible that	May, Might, Can, Could
Keep in mind	Remember, Note
Known as	Called, Named
Lethargic	Dull, Slow
Limitation	Limit
Locate	Find
Location	Place
Maintain	Keep, Support
Majority	Most
Malformation	Abnormal shape, Deformity
Manually	By hand
Maximum	Most, Greatest
Meticulous	Very careful
Minimize	Decrease, Lessen
Mitigating	Moderating
Modification	Change

Monitor	Check, Watch
Motionless	Still, Inert
Multiple	Many
Nauseous	Sickening
Necessary	Needed
Need to have	Need
No more than	Only
Not possible	Impossible
Not the same	Different
Numerous	Many
Obligate	Pledge, Bind, Compel
Observe	See
Obstacles	Problems
Obtain	Get
Occurrence	Event
On a regular basis	Regularly
On the basis of	By, From, Because of, Assuming, Based on
On the surface	Seemingly, Apparently
Opportunity	Chance
Option	Choice, Way
Organizations	Companies
Other people	Others
Over and over again	Repeatedly
Over the course of	During, Throughout
Participate	Take part
Particular	Specific

Past experiences	Experiences
Perform	Do
Permit	Let
Physician	Doctor
Portion	Part
Position	Place
Possess	Have, Own
Posterior	Rear
Predisposition	Tendency
Predominant	Main, Superior
Preparation	Readiness
Previous(ly)	Past, Earlier, Before
Primary	Main, First
Prior to	Before
Procedure	Rule, Way, Method, Treatment, Operation
Proceed	Do, Go on
Produce	Make
Profound	Deep, Thoughtful
Program	Plan
Proximity	Nearness
Purchase	Buy
Rapid	Quick
Recommend	Suggest
Reduce	Cut
Regimen	Routine, Rule
Regulations	Rules, Laws

Reinforce	Strengthen
Relating to	About, As for, For, In, Of, On, Over, To, Toward, With
Remain	Stay
Reported back	Reported
Request	Ask
Require	Need
Result in	Lead to
Review	Check
Rigorous	Harsh, Strict
Saline	Salty
Segment	Part
Similar	Like
Simultaneously	At the same time
Solitary	Alone, Single
Start out	Start
Strategy	Plan
Subsequent	Later, Next
Substantial	Real, Strong, Large
Superior	Better
Take advantage of	Abuse, Exploit, Use
Take into account	Consider
Tell the difference	Discriminate
The fact that	That
The majority of	Most, Most of
There is a chance that	May, Might, Can, Could

Therefore	So, Thus
To a certain extent	In a sense, Somewhat, Partly
To begin with	First
Total number of	Total
Transmitted	Sent
Typically	Often
Unfamiliar	Unknown
Usually	Often
Variation	Change, Difference
Via	In, On, By
Whenever	When
Whereas	Since
With regard to	About, Regarding

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