

Determining Readability

How to Find Out Whether Users
Understand Your Content

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Munich

The Reading Process

Decoding

**Recovering the spoken
word that the printed
word represents**

phoneme

morpheme

The quick brown fox
jumps over the lazy dog

literal comprehension

小草有生命，足下多留“青”

The grass has the life, you keep
“blue”



Find out what users
understand,
not what they say they
understand.

**Test Text
with Users**

Cued response

**Read the text,
then paraphrase aloud**

Periodic Finance Charge Calculation—Two-Cycle Average Daily Balance Method (Including New Purchases) for Purchases and Average Daily Balance Method (Including New Transactions) for Other Transactions: We calculate **Periodic FINANCE CHARGES** separately for each feature such as Purchases, Overdraft Advances, Cash Advances, Balance Transfers, Convenience Checks or promotional balances. We figure the **Periodic FINANCE CHARGES** by applying the applicable Daily Periodic Rate shown in the Table of Interest Charges to each feature's daily balance for each day of the current billing cycle. In addition, for Purchases, we apply the Daily Periodic Rate to the daily balance for each day of the previous billing cycle adjusted as described below.

To get the daily balance for each day of the current billing cycle, we take the beginning balance for each feature, add any new transactions or other debits (including fees and other charges), subtract any payments or credits, and make other adjustments. Transactions are added as of the later of the transaction date or the beginning of the billing cycle in which they are posted to your Account (except that Convenience Checks are added as of the date accepted by the payee). Fees are added either on the date of a related transaction or the last day of the billing cycle. This gives us that day's daily balance. A credit balance is treated as a balance of zero. We multiply the daily balance by the applicable Daily Periodic Rate, as stated in the Table of Interest Charges, to get your **Periodic FINANCE CHARGES** for that day. We then add these **Periodic FINANCE CHARGES** to your daily balance to get the beginning balance for the next day. For Purchases, we do the same thing for each day of the previous cycle to get the daily balance of Purchases for the previous billing cycle. However, the daily balance for previous billing cycle Purchases is considered to be zero for each day of the previous billing cycle if a **Periodic FINANCE CHARGE** was already imposed on Purchases itemized on your previous statement or you paid your New Balance on your previous statement in full by the payment due date.

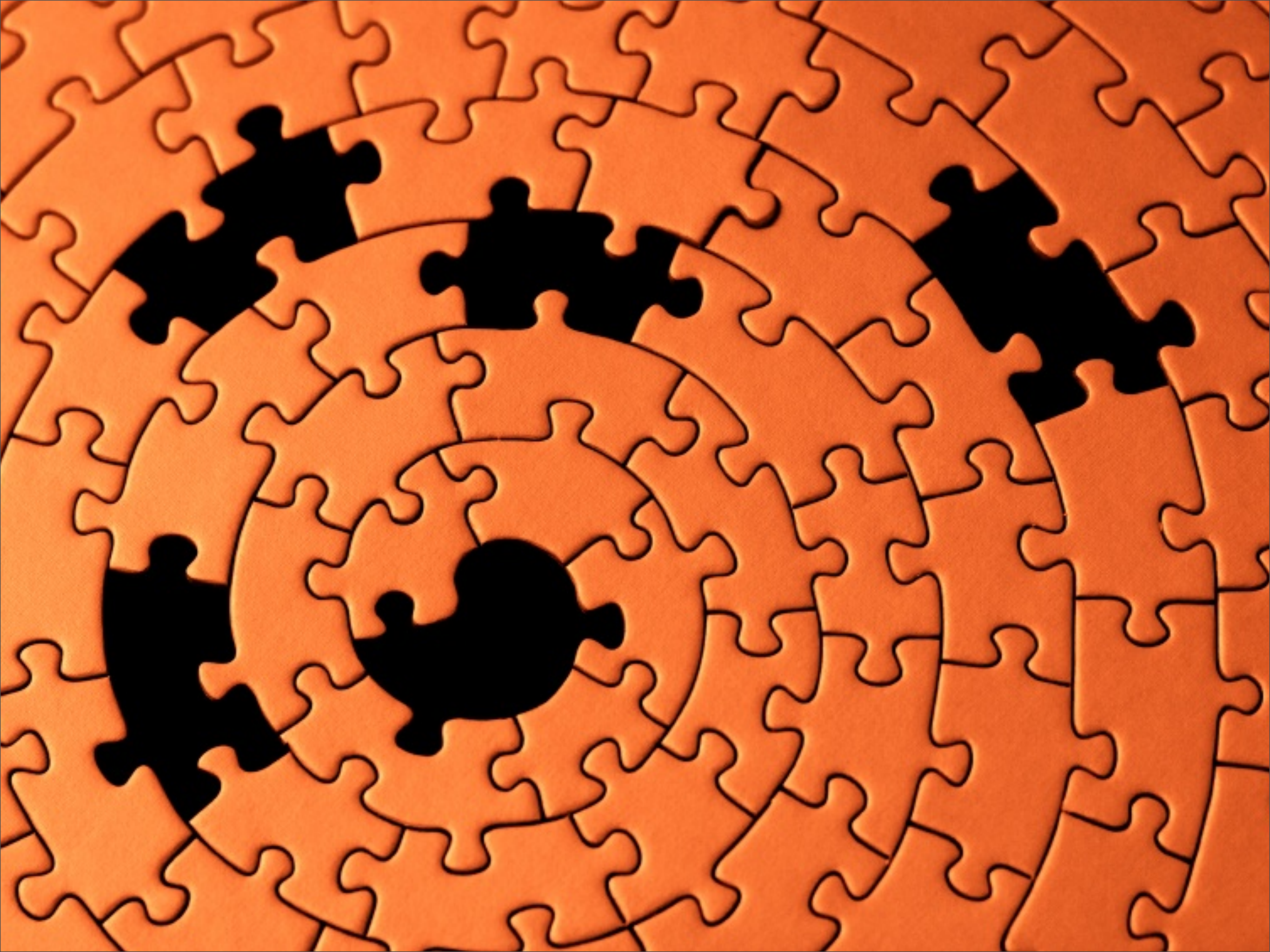
To get your total **Periodic FINANCE CHARGE** for a billing cycle, we add all of the daily **Periodic FINANCE CHARGES** for all features. If you multiply the Average Daily Balance for each feature by the applicable Daily Periodic Rate and the number of days in the applicable billing cycle(s) and add the results together, the total will equal the **Periodic FINANCE CHARGES** for the billing cycle, except for minor variations due to rounding. To determine an Average Daily Balance, we add your daily balances and divide by the number of the days in the applicable billing cycle(s).

Pre-test / Post-test

**Test domain knowledge,
Read the text,
Test again**

Cloze procedure

**Delete every 5th word,
fill in the blanks**



Activity

Cloze Procedure

Cloze Example

Short-term memory works a _____ like the bucket you _____ to catch water dripping _____ a leak in the _____. When the bucket is _____ —but you can see _____ more water is coming— _____ do you do? You _____ it all out and _____ the empty bucket back _____ the leak. If short-term _____ has been filled to _____ but more is coming, _____ don't selectively discard what's _____ there. We dump everything _____ so we can catch _____ rest. That means it's _____ a good idea to _____ lots of information hoping _____ readers will remember some _____ it. It's likely they _____ remember any of it. _____ characteristic of short-term memory _____ to everyone, but there _____ differences in the size _____ the bucket. Adults with _____ literacy skills can store _____ seven chunks of information _____ a time in short-term _____. The number for poor _____ may be closer to _____ or fewer.

Cloze Example

Short-term memory works a LOT like the bucket you USE to catch water dripping FROM a leak in the CEILING. When the bucket is FULL —but you can see THAT more water is coming— WHAT do you do? You THROW it all out and PUT the empty bucket back UNDER the leak. If short-term MEMORY has been filled to CAPACITY but more is coming, WE don't selectively discard what's CURRENTLY there. We dump everything OUT so we can catch THE rest. That means it's NOT a good idea to LIST lots of information hoping YOUR readers will remember some OF it. It's likely they WON'T remember any of it. THIS characteristic of short-term memory APPLIES to everyone, but there ARE differences in the size OF the bucket. Adults with ADEQUATE literacy skills can store AROUND seven chunks of information AT a time in short-term MEMORY. The number for poor READERS may be closer to FIVE or fewer.

Score = (exact matches / blanks)

- 60% or more: “independent level”
Reader understood 90% of the material
- 40-60%: “instructional level”
Reader understood 75% of the material
- Under 40%: “frustration level”
Material is too difficult for this audience



**Estimate the
Grade Level
of Text**

Readability Formulas

Flesch Grade Level Formula

$$.39 \times \left(\frac{\# \text{ of words}}{\# \text{ of sentences}} \right) + 11.8 \times \left(\frac{\# \text{ of syllables}}{\# \text{ of words}} \right) - 15.59$$

**syntactic
factor**



**semantic
factor**



Activity

Fry Readability Graph

Fry Readability Graph Exercise

“ I stand here today humbled by the task before us, grateful for the trust you have bestowed, mindful of the sacrifices borne by our ancestors.

Forty-four Americans have now taken the presidential oath. The words have been spoken during rising tides of prosperity and the still waters of peace. Yet, every so often, the oath is taken amidst gathering clouds and raging storms. At these moments, America has carried on not simply because of the skill or vision of those in high office, but because We the People have remained faithful to the ideals of our forebearers, and true to our founding documents.”

Use a 100-word sample

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Count the number of syllables and sentences

“ I stand here today humbled by the task before us, grateful for the trust you have bestowed, mindful of the sacrifices borne by our ancestors.

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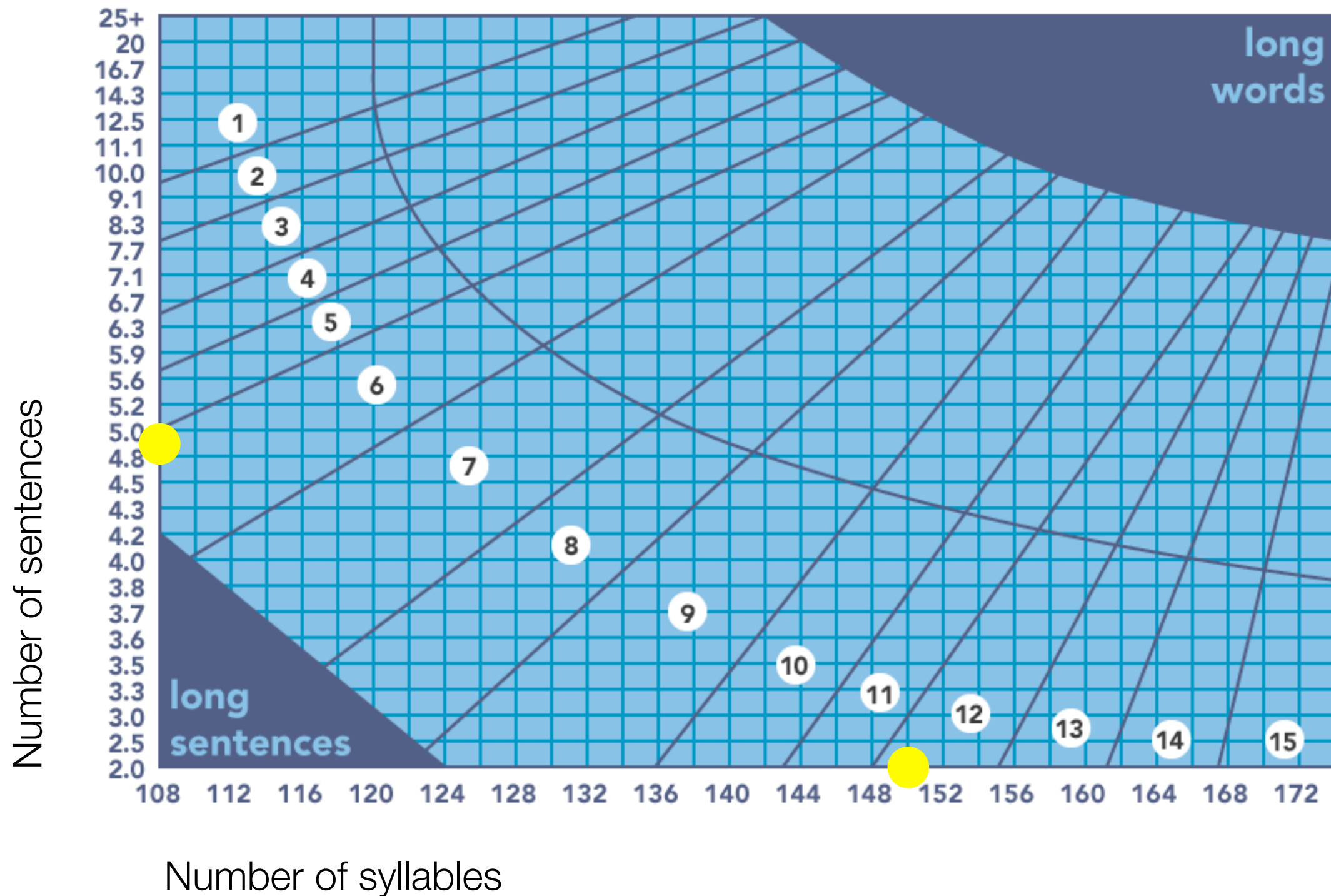
Only mark after the first syllable

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”

Fry Readability Graph



Remember to

- Understand the limitations of formulas
- Use an appropriate formula
- Use an automated tool
- Prepare the text
- Avoid writing to the formula

**This sentence is written at a
second grade level:**

The quick brown fox
jumps over the lazy dog.

So is this one:

Brown over the dog
quick the lazy jumps fox.

This one too:

Dxr owcn kothv ert oghe
qazui pelju mps foy.

Remember to

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Sample Evaluation and Statistics

File

Sample Begins: from page 96 of "The Art of ..."

Evaluated On: 1/24/2008 8:49 AM

Grade Level ...

Flesch Reading Ease: * 75
 Flesch Grade Level: 6.1
 FOG: 10.0
 Powers: 5.2
 SMOG: 9.8
 FORCAST: 8.5

Raw Counts ...

Words: 146
 Syllables: 204
 Syllables (Fry): 205
 Monosyllabic Words: 112
 Words of 3 or More Syllables: 17
 Difficult Words (FOG): 17

Sentences: 11

* Per scale of from 1 to 100. See HELPS opposite ...

File Click to capture this data in a file for reviewing and/or printing. Clicking opens a Save As dialog box... enabling you to assign a file name.

Print Click to print this data on a printer that is available now. If print problems, see User Guide for alternative ways to obtain a printed report.

Fry Click to continue on by viewing the Fry Graph.

New Click to begin another Sample ... else use the File menu to capture a new sample.

HELPS ...

SAMPLE BEGINS The top-most entry at the left ... If it includes unrecognizable characters, the Sample file is likely not in a plain text format, and the resultant Raw Counts and Grade Levels are may not be reliable. See User Guide for details.

Readability Studio - [A Christmas Carol]

File Edit View Readability Tools Window Help

Test	U.S. Grade Level	Reader Age	Scale Value
Coleman-Liau	7.3	12	
Flesch Reading Ease			79
Fry	6	11	
Gunning Fog	8.6	13	
Laesbarhedsindex (LIX)	6	11	31
New Dale-Chall	5-6	10	
Rate Index (RIX)	7	12	2.6
Raygor Estimate	7	12	
SMOG	8.0	13	
Average (Mean)	6.9	11.8	N/A

Gunning Fog Explanation

This document is at least suitable for a reader at the *eighth grade (sixth month of class completed)* level.

Gunning Fog Index is generally recommended for business publications and journals. This test is influenced by words containing three or more syllables. To lower a document's score, try to use words of one to two syllables in place of larger, more complex words.

Remember to

- Understand the limitations of formulas
- Use an appropriate formula
- Use an automated tool
- Prepare the text
- Avoid writing to the formula

“Improving comprehension by writing to a readability formula is like lighting a match under a thermometer to warm up a room.”

George Klare



Estimate the Reading Level of Users

Who is the general public?

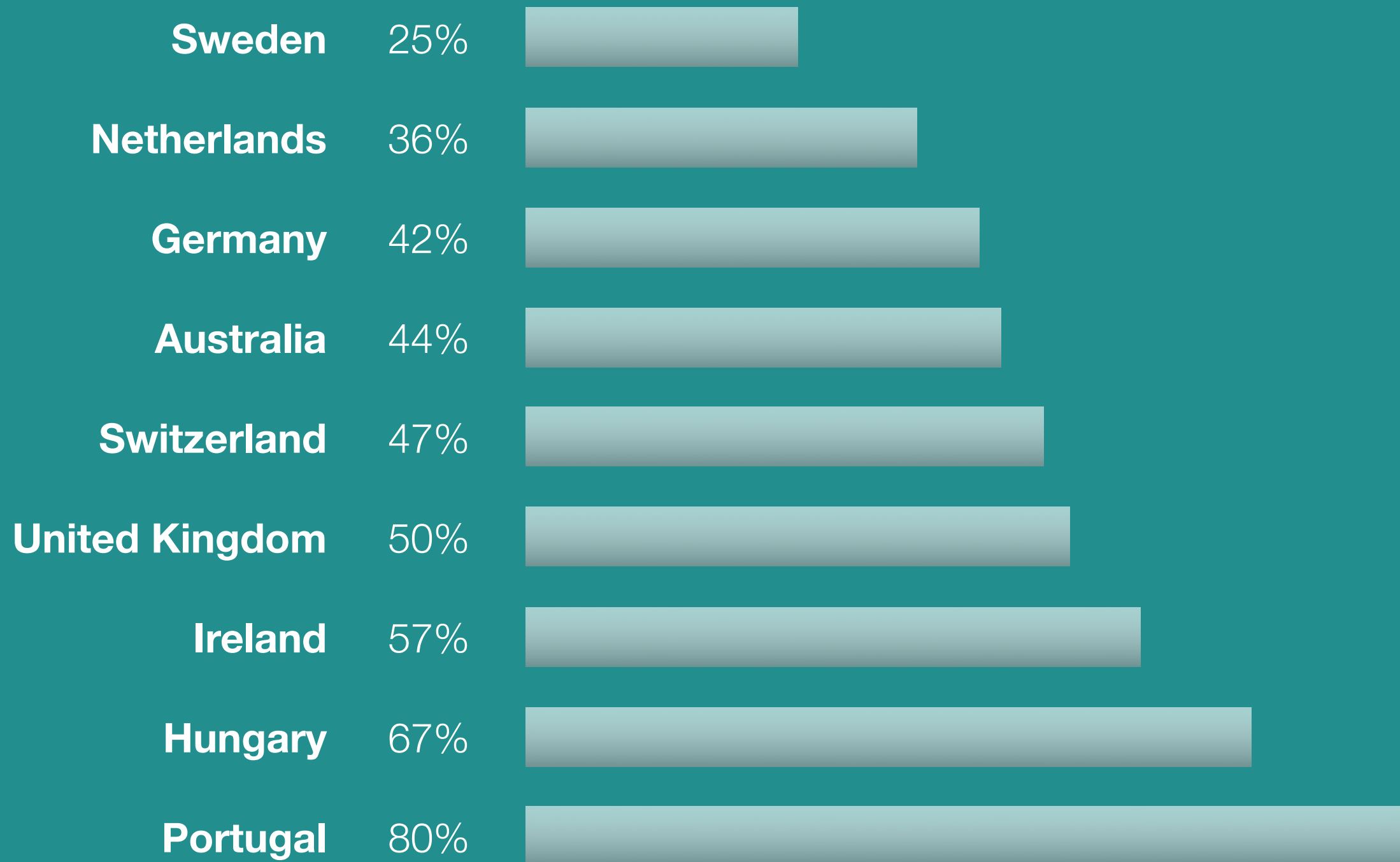


In the United States

44%

**of adults have low
literacy skills**

Rate of adults with low literacy skills



1998 International Adult Literacy Survey (OECD)

REALM

Rapid Estimate of Adult Literacy in Medicine

- Word recognition test
- Quick and easy to administer
- Participant says each word out loud. Scored on number **pronounced** correctly
 - 61-66: not low lit
 - 45-60: grade 7-8
 - 19-44: grade 4-6
 - 0-18: grade 3 or below
- Doesn't matter if they know the word's meaning

Davis T, Long S, et al
Rapid estimate of adult literacy in medicine: a shortened screening instrument
Fam Med. 1993; 25: 391-395

fat	fatigue	allergic
flu	pelvic	menstrual
pill	jaundice	testicle
dose	infection	colitis
eye	exercise	emergency
stress	behavior	medication
smear	prescription	occupation
nerves	notify	sexually
germs	gallbladder	alcoholism
meals	calories	irritation
disease	depression	constipation
cancer	miscarriage	gonorrhea
caffeine	pregnancy	inflammatory
attack	arthritis	diabetes
kidney	nutrition	hepatitis
hormones	menopause	antibiotics
herpes	appendix	diagnosis
seizure	abnormal	potassium
bowel	syphilis	anemia
asthma	hemorrhoids	obesity
rectal	nausea	osteoporosis
incest	directed	impetigo

Activity

REALM

**How have *you* tested
readability**



Q&A

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