Chunking

A technique of combining many units of information into a limited number of units or chunks, so that the information is easier to process and remember.

The term *chunk* refers to a unit of information in short-term memory—a string of letters, a word, or a series of numbers. The technique of chunking seeks to accommodate short-term memory limits by formatting information into a small number of units. The maximum number of chunks that can be efficiently processed by short-term memory is four, plus or minus one. For example, most people can remember a list of five words for 30 seconds, but few can remember a list of ten words for 30 seconds. By breaking the list of ten words into multiple, smaller chunks (e.g., two groups of three words, and one group of four words), recall performance is essentially equivalent to the single list of five words.[1]

Chunking is often applied as a general technique to simplify designs. This is a potential misapplication of the principle. The limits specified by this principle deal specifically with tasks involving memory. For example, it is unnecessary and counterproductive to restrict the number of dictionary entries on a page to four or five. Reference-related tasks consist primarily of scanning for a particular item; chunking in this case would dramatically increase the scan time and effort, and yield no benefits.

Chunk information when people are required to recall and retain information, or when information is used for problem solving. Do not chunk information that is to be searched or scanned. In environments where noise or stress can interfere with concentration, consider chunking critical display information in anticipation of diminished short-term memory capacity. Use the contemporary estimate of 4 ± 1 chunks when applying this technique.[2]

See also Errors, Mnemonic Device, Performance Load, and Signal-to-Noise Ratio.

[1] The seminal work on short-term memory limits is "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information" by George Miller, *The Psychological Review*, 1956, vol. 63, p. 81–97. As made evident by the title of Miller's paper, his original estimate for short-term memory capacity was 7 ± 2 chunks.

[2] A readable contemporary reference is *Human Memory: Theory and Practice* by Alan Baddeley, Allyn & Bacon, 1997. Regarding short-term memory limits, see, for example, "The Magical Number Four in Short-Term Memory: A Reconsideration of Mental Storage Capacity" by Nelson Cowan, *Behavioral and Brain Sciences*, 2001, vol. 24, p. 87–114.

This e-learning course by Kaplan EduNeering makes excellent use of chunking. Note that the number of content topics (left gray panel) observes the appropriate limits, as do the information chunks on the topics themselves. Overview and Challenge are not counted because they contain organizing information and quizzes only.

List 1	List 2
angry	thrunced
hoarse	rooped
snuggle	croodle
search	poosk
fatigue	quanked
stutter	maffle
scorch	brizzle
warning	gardyloo
teenager	haspenald
anxious	cark

Familiar words are easier to remember and chunk together than unfamiliar words. Of the two lists, list 1 is easier to recall.

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Large strings of numbers are difficult to recall. Chunking large strings of numbers into multiple, smaller strings can help. Most people can remember their Social Security number and frequently called phone numbers.