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# Fermi problems as tools for understanding number generation and Benford's law

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## Abstract

Fermi problems are often taught in science and engineering as a technique for difficult numerical estimation in which a question is broken down into sub-questions that people can more confidently estimate. Thus, they may be tools providing insight into how people estimate numbers. However, there are no empirical studies into the effectiveness of Fermi problems. This study presented participants with the same questions as both Fermi problems (with sub-questions) and as non-Fermi problems (no sub-questions) and tested the hypothesis that participants' estimates would be more accurate when presented with Fermi problems than non-Fermi problems. The same data tested a hypothesis that participants would better fit to Benford's law when presented with Fermi problems than non-Fermi problems. Neither hypothesis was supported, although the strong fit of peoples estimates to Benford's law was replicated. This first attempt to empirically examine Fermi problems pointed to ways to more rigorously test these hypotheses.