

Seven Things We Learned Analyzing 515 Million Wordles

Maybe it's time to say goodbye to ADIEU?



By Josh Katz and Aatish Bhatia

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Millions of people play Wordle every day, and share, discuss and debate how they tried to win.

For the first time, we've analyzed how players performed in half a billion of those Wordle games over the past year and compared their results with the strategies that our WordleBot recommends.

Here are seven things we learned:

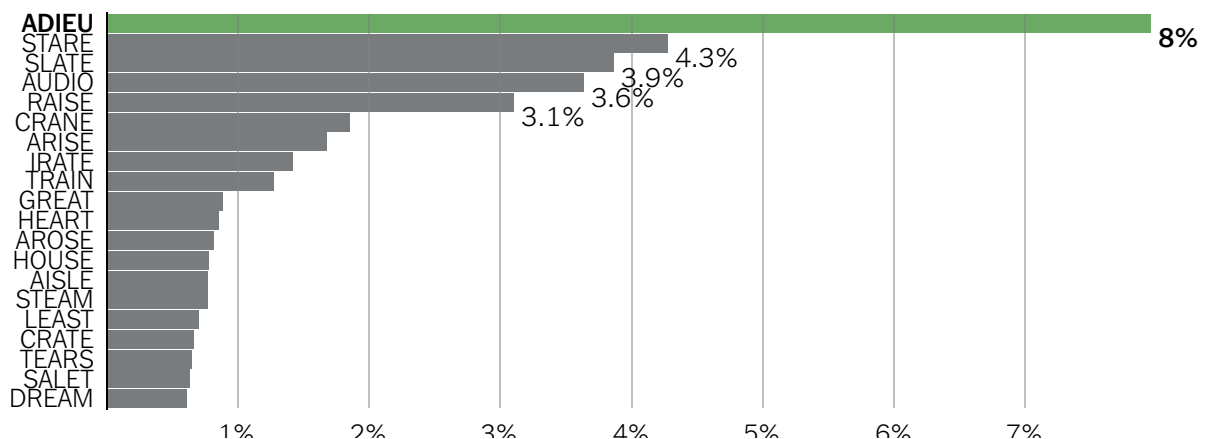
1. Of the top 30 starting words, ADIEU is the most popular but least efficient.

Many, many words have been written about the *best* opening word for Wordle. Answering this question was, in fact, one of the motivations behind WordleBot's development. In its robot brain, a handful of words — **SLATE**, **CRANE**, **TRACE** — are given the bot's seal of approval as leading to the solution in the fewest guesses on average.

But for human Wordle players, the most popular opening word by some margin is **ADIEU**, with **AUDIO**, another four-vowel word, not far behind.

The most popular Wordle starting words

Based on 515 million Wordle games completed between Dec. 1, 2022, and Nov. 30, 2023.

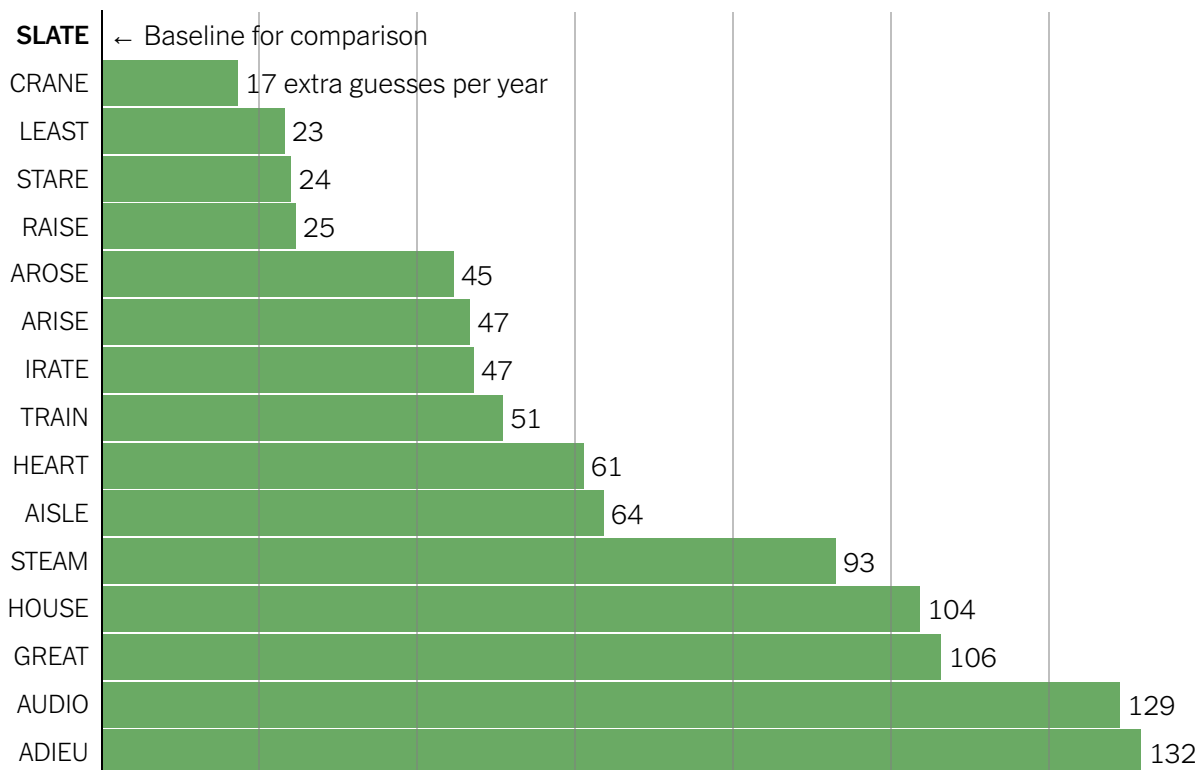


The strategy seems to make sense: Figure out the vowels, and the other letters will fall into place. The bot has never favored starting this way, but it's possible that the best strategy for a computer is not the best strategy for a human.

Our new analysis, though, shows that starting with **ADIEU** or **AUDIO** does actually put human players at a disadvantage. How much of one?

On average, players who started with **ADIEU** needed about a third of a turn more to solve their Wordles compared with players who started with **SLATE**, adding up to 132 extra turns over the course of a year.

Extra guesses needed to solve Wordle, compared with starting with SLATE



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Even worse: While 1.7 percent of **SLATE** starters failed to solve a Wordle on average, the chance of failure with **ADIEU** more than doubled, to 3.6 percent.

We can't say for certain that starting with **ADIEU** *causes* players to do worse. It could be that players who start with **ADIEU** are more casual players, or are less concerned with solving in the fewest number of guesses. After all, not everyone cares about raw efficiency when they play. But we can say that, of the 30 most popular Wordle openers, **ADIEU** performed the worst.

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In general, the average WordleBot user solves a puzzle in about a quarter of a turn less than the average Wordle player.

2. People like holiday words: **PARTY, HEART, BUNNY, GHOST.**

The bot starts with **SLATE** every day, which can be boring. Human players, freed from the burdens of mathematical precision, can and do change their Wordle openers throughout the year. (Players often explain their daily selection in the Wordle Review.)

Here are the top opening words that jumped in popularity on specific days:

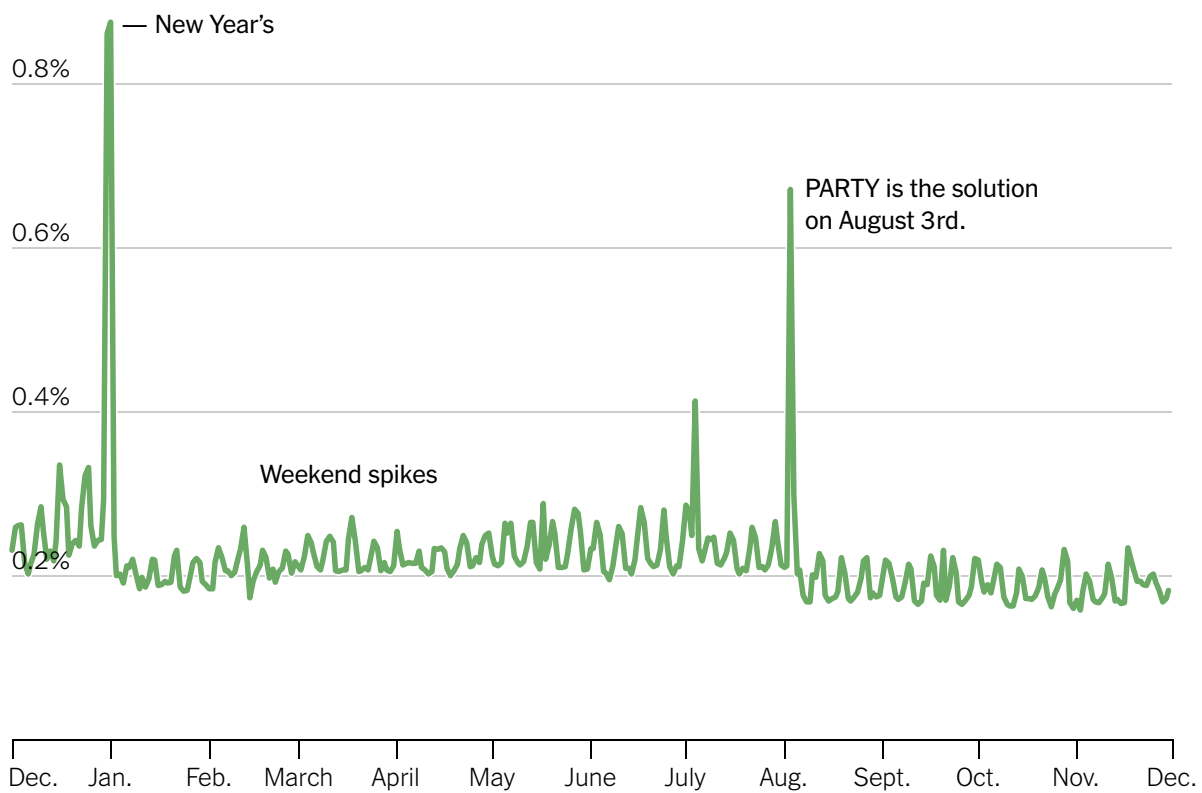
- Christmas Eve (Dec. 24, 2022): **MERRY**
- Christmas Day: **MERRY, GIFTS, PEACE**
- New Year's Eve: **PARTY, YEARS**
- New Year's Day (Jan. 1, 2023): **YEARS, PARTY, HAPPY, FRESH**
- The Super Bowl (Feb. 12): **SUPER**
- Valentine's Day: **HEART, LOVER, CUPID**
- St. Patrick's Day: **LUCKY**

- Easter: **RISEN, BUNNY**
- Coronation of Charles III and Camilla (May 6): **CROWN, ROYAL**
- Labor Day: **LABOR**
- Halloween: **GHOST**
- Thanksgiving: **THANK, GRAVY, FEAST**

Another fun pattern: **PARTY** has a little spike every weekend.

How often Wordle players start by guessing **PARTY**

1% of all opening guesses



Based on 515 million Wordle games completed between Dec. 1, 2022, and Nov. 30, 2023.

3. More people solve Wordle on their first guess than can be explained by chance.

In the list above, we excluded first guesses that were that day's Wordle solution.

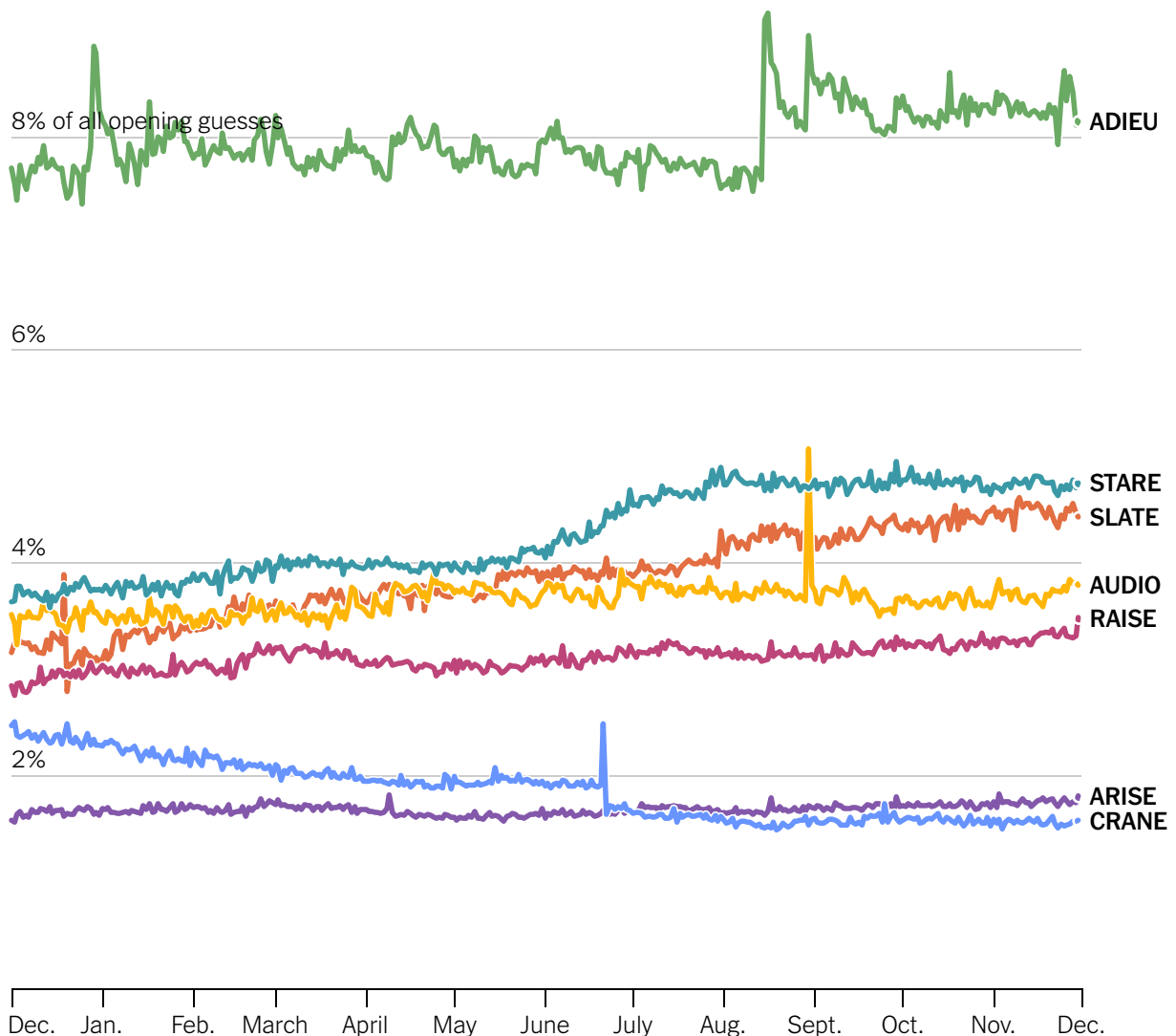
That's because, about one game in every 250, a reader gets the answer right on the first try. This is much more often than you'd expect if you just left things to chance, although not necessarily every case is outright cheating.

Some may be using a new window to make additional guesses after failing to solve the puzzle in six tries. Some may be re-entering a solution they found on a different device to maintain a streak, or to test a technical issue. Others may have had the answer spoiled, or, yes, may have looked it up.

4. SLATE and STARE are on the rise, while CRANE is getting less popular.

Here you can see which opening words have become more popular over time. **ADIEU** remains dominant, and its popularity as an opening guess has even grown.

The most popular Wordle opening words



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The spikes in popularity from outside events — when “**ADIEU**” was featured in the Mini Crossword in August — or from when a word appears as a solution — **AUDIO** on Aug. 30, **CRANE** on June 21 — are evident.

5. The toughest words? Keep an eye on J.

The hardest words to solve started with J, ended in Y or had a double letter somewhere. The hardest of all the words last year, **JAZZY**, has all three. The five hardest words of the past year, as measured by turns to solve:

- **JAZZY** (June 1): 5.82 turns to solve
- **JOKER** (April 25): 5.69 turns to solve
- **NANNY** (June 3): 5.68 turns to solve
- **JUDGE** (Dec. 26): 5.57 turns to solve
- **RIPER** (Feb. 22): 5.52 turns to solve

If you measure by solve rate, the hardest Wordle puzzle was **JOKER**, with only 71 percent of players finding the solution.

6. The words that most surprised the bot included **ANODE** and **MATEY**.

For over a year, there's been no solutions list for WordleBot to consult. Instead, the bot assigns just about every five-letter word in the English language — all 14,855 accepted Wordle guesses — a probability of being a solution. (The bot has no role in choosing the words that appear as Wordle solutions; if it did, this task would be much easier.)

Most of these words — from **AAHED** to **ZYMIC** — are considered too obscure to be a likely solution, and are given a zero percent chance. For the rest of the words, the more common a word is (as measured by how frequently it has appeared in The New York Times since 2000), the higher the chance the bot assigns it.

Most words that have appeared as solutions — everything from **ABIDE** to **YOUTH** — were given the maximum possible chance. But every so often, a solution sneaks up that surprises the bot. Its solution model isn't perfect! This is an area where a savvy human player can outperform the bot.

Here are the solutions from the last year that most surprised the bot, along with what the bot thought was their likelihood of appearing, relative to the most common words.

- **ANODE** (Aug. 5): 67.9%
- **MATEY** (Jan. 22): 73.2%
- **BORAX** (April 12): 81.2%

- **GUPPY** (May 4): 86.0%
- **DEBUG** (Feb. 11): 89.4%

7. The bot is learning from your guesses.

Human players are free to choose any of the roughly 15,000 accepted Wordle words when playing. The bot is not so lucky.

Deciding which words are common enough for the bot to recommend has been a judgment call. We want the bot to be as skilled as possible. On the other hand, it wouldn't be useful having a bot that chided players for not guessing words like **AWDLS**, **LAARF** or **YOKEG**.

Incorporating data from player guesses will allow us to be more deliberate about which words the bot recommends. In the days ahead, we'll delete a handful of words from the bot's list, and make way for roughly 50 additions. A new batch of scientific terms — **MALIC**, **CILIA**, **BORIC** and **NODAL** — along with many food-related words — **PANKO**, **MOREL**, **CHILE**, **UMAMI** and **BENTO** — will make an appearance (again, this has nothing to do with actual Wordle solutions). We assume the bot has been spending more time reading the Science section and NYT Cooking.

Note: In instances when we calculated average guesses, failed puzzles counted for 7.5 guesses.

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