Opinion Just how big should the House be? Let's do the math.

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We all know that democracy is about words and law, oratory and policy. But democracy is also about math. This is one of its most interesting features.

First, that's because you have to count the people. While many ancient societies counted people for taxation, we get the word "census" from the ancient Romans. Part of their government was based on a popular sovereignty principle. In addition to using the numbers for purposes of taxation, they also used the census to organize voters. The modern census appeared with the American invention of constitutional democracy and the constitutional requirement for a decennial census. It is now a fixture of modern political and policy administration. Over time, the census became the basis for much of the work in social statistics that provides the foundation for modern policymaking.

Democracy is also about math because you use math for decision-making. Which decisions will be decided by a simple majority vote — by 50 percent plus one? Which will require a supermajority? And should that supermajority be a two-thirds or a three-quarters threshold?

The general idea is that you use a simple majority for matters of ordinary, passing and contingent concern. Supermajorities should be reserved for matters that rise to a constitutional level. (Here this, O ye Senate: Your filibuster does not accord with centuries of best practice in democratic design.)

And democracy is about math because of the principle of one person, one vote.

But even here matters can get complicated. For instance, humans aren't spread out over geographical space in mathematically neat ways. The original design of the House of Representative aimed for a ratio of 30,000 constituents per representative. But state populations don't come in neat multiples of 30,000, or any other number. There is always a remainder, and what do you do with that? Round up and allocate an extra seat, or round down and increase the number of constituents per representative in that state?

How to renovate American democracy

Contributing columnist Danielle Allen, a political theorist at Harvard University, is calling for a democracy renovation. She says it's time to update the old house we all share to 21st-century standards. Her new series explains how to do it.

Originally, using a rounding-down method, congressional districts had a ratio of constituents to representative ranging from 33,159 (New York) to 55,540 (Delaware), according to independent scholar Michael Rosin. This was the plan developed by Thomas Jefferson. Alexander Hamilton, rounding up, proposed a more representative plan with ratios ranging from 27,770 (Delaware) to 35,418 (Georgia). But the Jefferson approach won out. These plans were as close as the designers could get to 30,000 constituents per representative given population distribution.

Now, however, with the growing population and the House frozen at 435 seats, the spread runs from about 500,000 constituents for each of Rhode Island's and Montana's members and 580,000 constituents for Wyoming's single member to 755,000 for each of California's 52 representatives and 778,000 for each of Florida's 28 representatives.

As I explained in my previous column, the Founders never envisioned districts so large, and their gradual expansion over a century is a major reason our politics have become so dysfunctional.

To get our politics working again, we need a system that delivers energy (the ability for the government to get things done), republican safety (protection of our basic rights), popular sovereignty (adaptive responsiveness to the will of the people) and inclusion (all voices should be synthesized in the national voice of our House of Representatives). Real proximity of representatives to their constituents is necessary for delivering on all those design principles. For that, we need a bigger, and continuously growing, House of Representatives. We need smaller districts and fairer representation between more- and less-populous places.

But how big should the House be? That is also to ask how small should a district be. And based on what math? And on what principle of growth?

Scholars and advocates have been working on this question for decades. There are seven basic options, all compiled in a report on enlarging the House by the American Academy of Arts and Sciences commission on the state of our democracy, which I co-chaired. Those options would increase the size of Congress from 435 to between 572 to 9,400. They are as follows:

The Wyoming Rule. Peg the size of a district to the population of the least-populous state, which is currently Wyoming (with about 580,000 people). That's 180,000 fewer constituents than today's average of 762,000 — and would yield a House of 572 members. The difficulty with this rule, though, is that it could cause the number of members to fluctuate dramatically depending on the growth patterns of the smallest states. One way to address that would be to pick the current number (580,000) as a stable ratio going forward. But that would lead to speedy growth in the size of the House over time.

The Deferred Maintenance Rule. When the size of the House was capped in 1929, new seats could shift to growing areas only by taking them away from other areas. The number of seats lost by particular states since 1929 through this method is 149. If we restored those seats and added one more to keep the total an odd number, then reallocated to achieve even districts, we would have a new base of 585 seats. This method is clean and yields districts slightly smaller than the current population of Wyoming. However, we would still need to figure out a principle of growth under this method. Would we take district sizes after such a reform as the standard ratio, and simply let the House grow in relation to it? This, too, would result in relatively fast growth.

The Cube Root Law. This method was developed to ensure that growth is slow and steady. Instead of picking a fixed number of House seats and establishing it as the target ratio for constituents to representatives, we would use the cube root of the national population to establish the number of legislators, then apportion across the states in proportion to state populations. Whenever the national population grows, so too would the number of representatives, but slowly compared with the other options. At our current population, this rule would give us 692 seats.

Here is a chart laying out the number of representatives you would have over time on three different growth principles, given population increases:

Size of the House of Representatives under three growth principles

Population	Linear 580,000 people per seat	Square root of the population per seat	Cube root of the population per seat
332 million	572	18,218	692
350 million	603	18,708	704
400 million	689	20,000	736
500 million	862	22,360	793
600 million	1,034	24,495	843

Source: Author's calculations.

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The U.S. population is projected to cross the 400 million mark in 2058. This means the pressure to add seats to the House will only increase — and slow, steady upward movement is probably better than fast. It would also be better than making a one-time move, only inevitably to face the same problem very soon thereafter.

When one recognizes the implications of projected population growth, the cube-root method comes to seem the simplest, soundest method for managing growth over time.

Its biggest problem is that it's initially hard to understand, because most of us don't have intuitions about cube roots. It sounds like a bad dental experience. So advocates worry that it would be hard to sell to the American public. But, hey, America! Can we handle the math, or what?

The Least Variation in District Size Rule. From 2010 to 2020, Rhode Island had two representatives and Montana had one, even though Rhode Island's population was only slightly larger. This method would address that by prioritizing districts that are roughly the same size across the country. At our current population, this rule would produce a House of between 909 and 1,014 seats, as per the American Academy of Arts and Sciences report.

Restore the 1913 Ratio. Another option would be to use the fixed ratio that characterized the House when the 435-seat number was established in 1913. At that time, there were 211,000 constituents per member. If we returned to that today, we would have a House of 1,572.

The James Madison Rule. Or we could be even more ambitious and use an even older aspirational ratio. In an amendment to the Bill of Rights as originally proposed, Madison sought a ratio of no more than 50,000 constituents per representative. His amendment is still out there, available for ratification. This would give us a House of roughly 6,500 members.

Restore the Original Ratio. Or we could be even more ambitious than that and restore the first actual ratio used: 35,000 constituents per representative. That would give us about 9,400 members. (If we wanted to add an eighth option, we could opt for George Washington's rule of no more than 30,000 constituents per representative. That would yield 11,000 members.)

As I wrote in my last column, two current representatives have introduced bills to increase the size of the House. Rep. Sean Casten (D-Ill.) has introduced a bill using the Wyoming Rule. Rep. Earl Blumenauer (D-Ore.) has offered one employing the deferred maintenance rule.

Of those, I'd go with Blumenauer's bill out of concern for the instability of the denominator used to create the ratio for the Wyoming bill. But the Blumenauer bill provides only a one-off solution. It doesn't give us a smooth way to resize the House over time. For that reason, and given the anticipated scaling up of our population, I do think the cube-root rule is best.

Perhaps it would be good for our collective math skills, too.

Which of the options do you think makes the most sense — and why? Can you come up with something better? I'd love to know your thoughts in the comments below.