

How Math Can Save Democracy



THE MATHEMATICS OF DEMOCRACY

WHAT IS *Packing and Cracking?*

Definitions: When district lines are drawn, various tactics can be used to maintain political power. For example:



Putting opposition voters into a small number of conceded districts is called **packing**.



Spreading opposition voters thinly over the rest of the districts to minimize their impact is called **cracking**.

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WHAT IS *the Efficiency Gap?*

Wasted votes are those that do not affect an election: either votes above the 50% majority threshold for a winning candidate or any for a losing candidate. The **efficiency gap (EG)** is one method for measuring gerrymandering

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WHAT IS *Polsby-Popper Compactness Score?*

We can try to quantify gerrymandering by measuring how "reasonably shaped" a voting district is. The **Polsby-Popper Compactness Score** of district S, $PP(S)$, measures how much "unnecessary" perimeter S has.