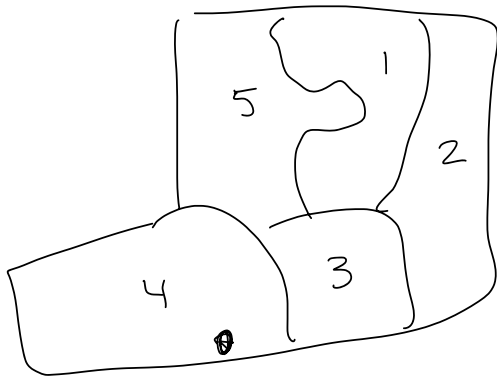


Gerrymandering

Drawing district lines for elections.

usually about Congressional Districts.



How do we decide
where the lines are
drawn?

↖ Jim Himes (D)

In CT, it's about 65% D
35% R

How many D vs R reps should CT have?

maybe 3D / 2R would be fair.
or 4D / 1R

in CT, all 5 reps are D's,
0 R's.

35% of people are R's,

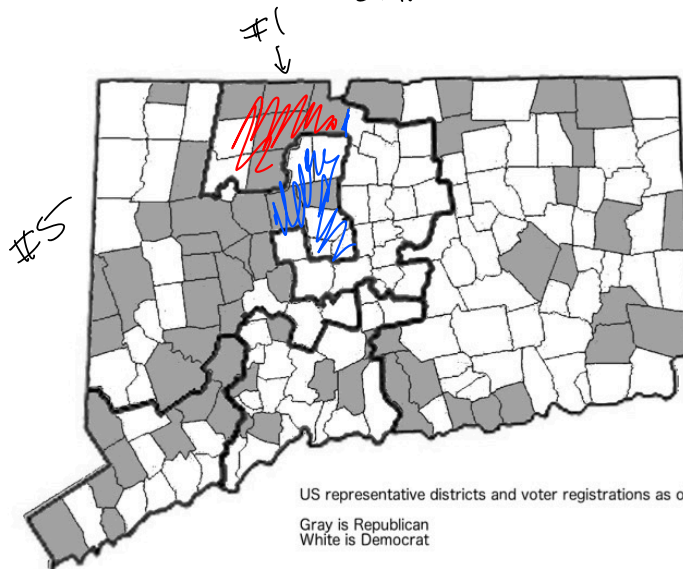
but 0% of reps are R's.

In every district, D's have a majority,
so they win everytime.

Problem for R's is they are geographically dispersed

USA does not have "proportional representation"

Where you draw the lines makes a huge
difference.



Lines look more
natural if we
give red to #5,
& blue to #1.

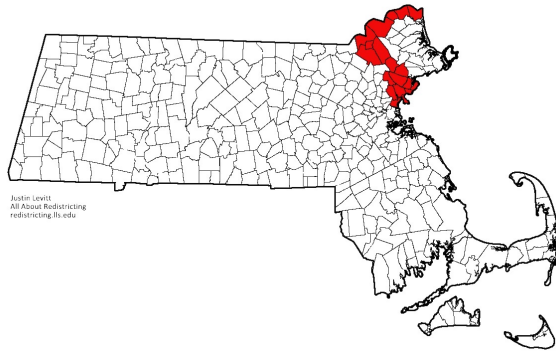
If we swap it like that, then
#5 will be majority R.

D's are already in power, so they keep
the map like this to get an advantage.

You can swing election results by redrawing the maps.

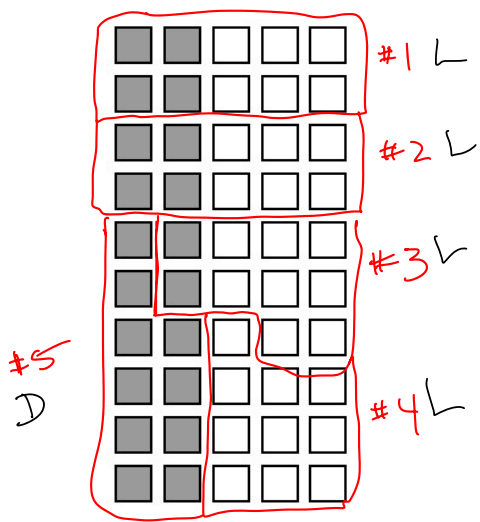
"Gerrymandering" ← drawing the maps to achieve a partisan advantage

Gerry MA governor in 1812



- How to rig an election by Gerrymander
- How to detect if maps are unfair.

↑
mathematical
measurements



50 squares,

20 dark D

30 light L

Let's make 5 districts of 10 people each.

#1: 6L, 4D

#2: 6L, 4D

#3: 8L, 2D

#4: 10L, 0D

#5: 0L, 10D

(L)

(L)

(L)

(L)

(D)

Results are
4L/1D

Can you get other outcomes?

5L/0D

I did → 4L/1D

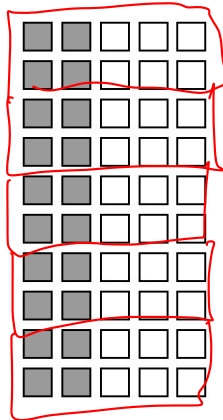
3L/2D

2L/3D

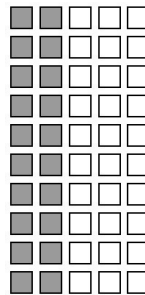
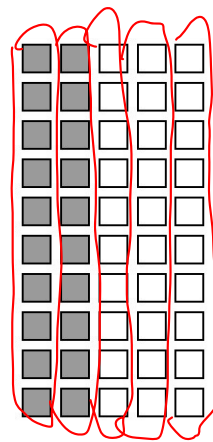
1L/4D

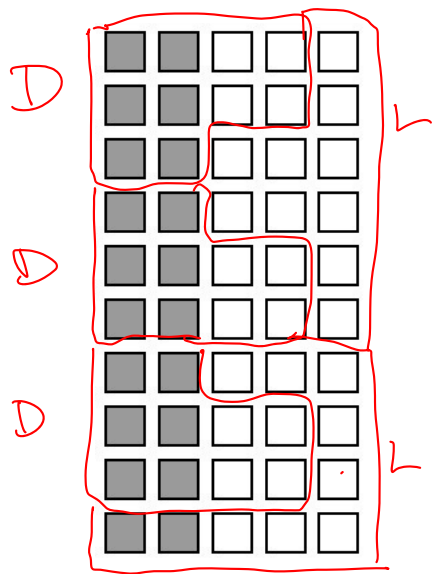
0L/5D

5L/0D



3L/2D





To win a district, D's need 6.

Specifically build 3 districts to have 6 D's each.

Give the rest to the L's

2L / 3D

Can we do 1L / 4D's ?

We need 6 voters to win a district, for 4 D wins, this requires at least

$$4 \times 6 = 24 \text{ D voters.}$$

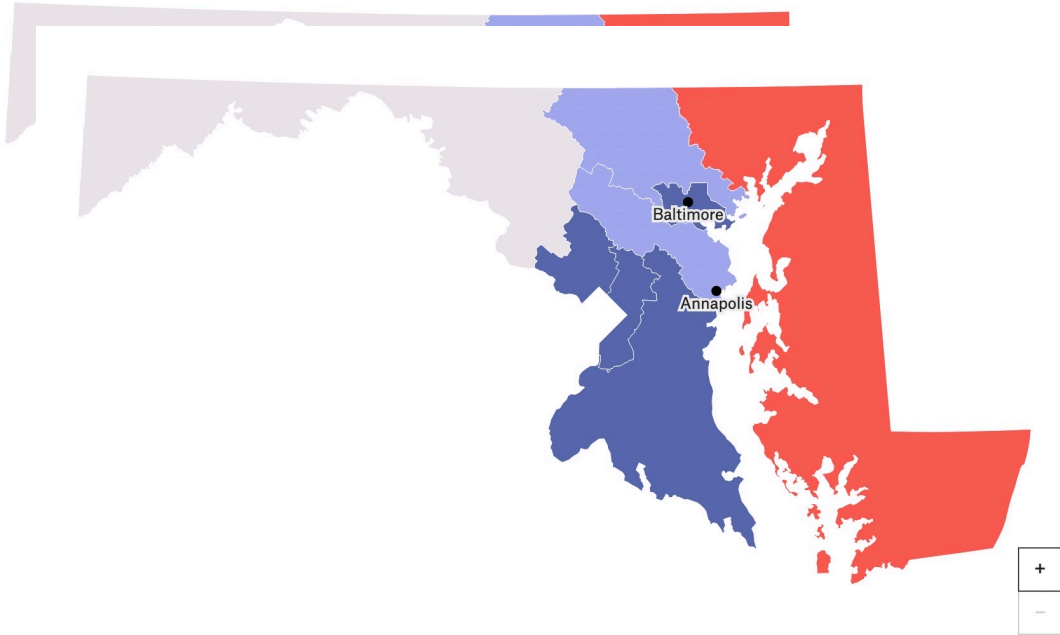
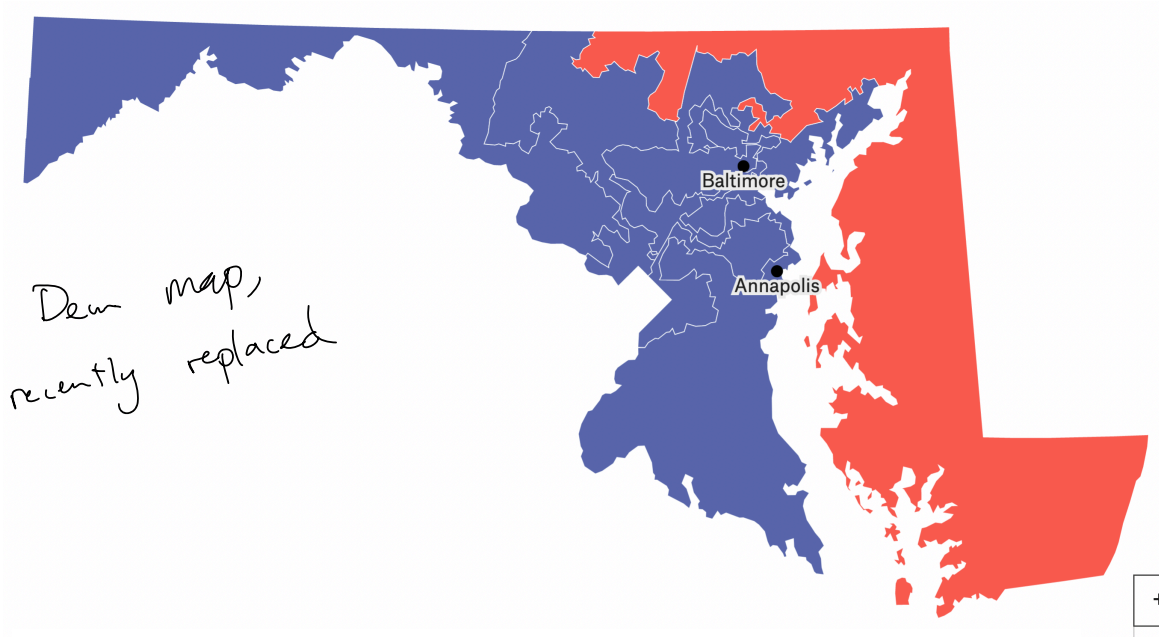
We only have 20 D voters, so

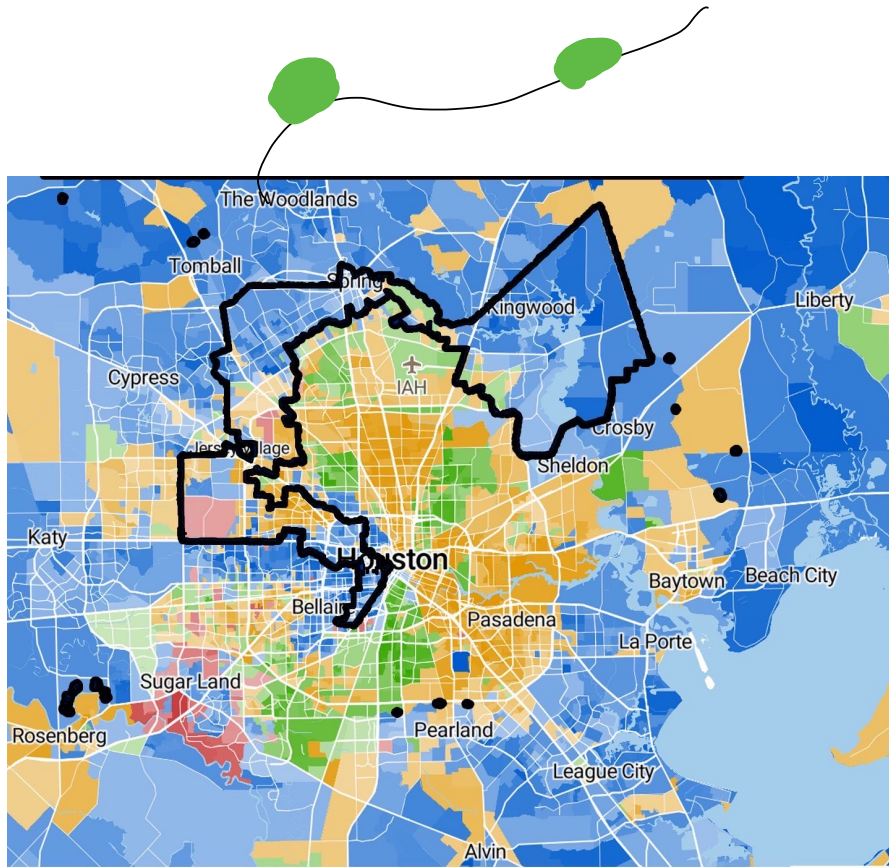
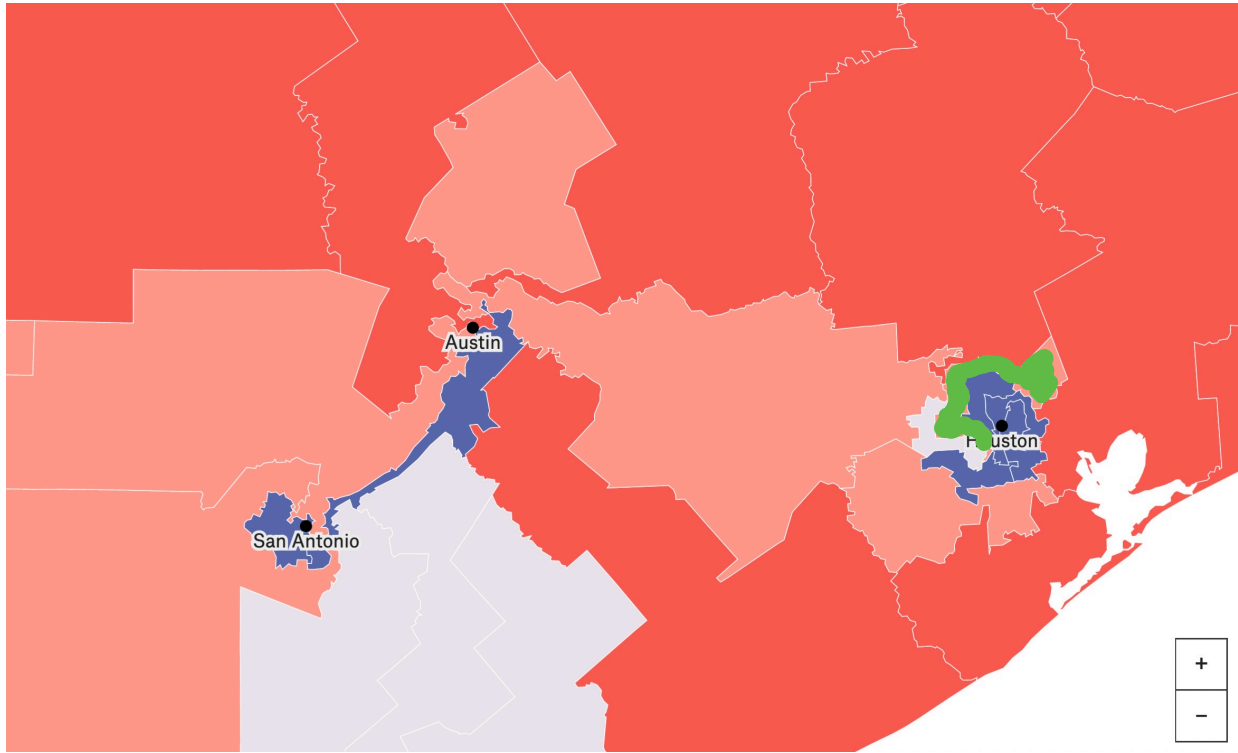
D's cannot win 4 districts
(or 5 districts)

4D / 1L and 5D / 0L are impossible.

Real examples :

A Dem map,
recently replaced





Majority Race Key

© Mapbox © OpenStreetMap Improve this map



In Chicago district #4

