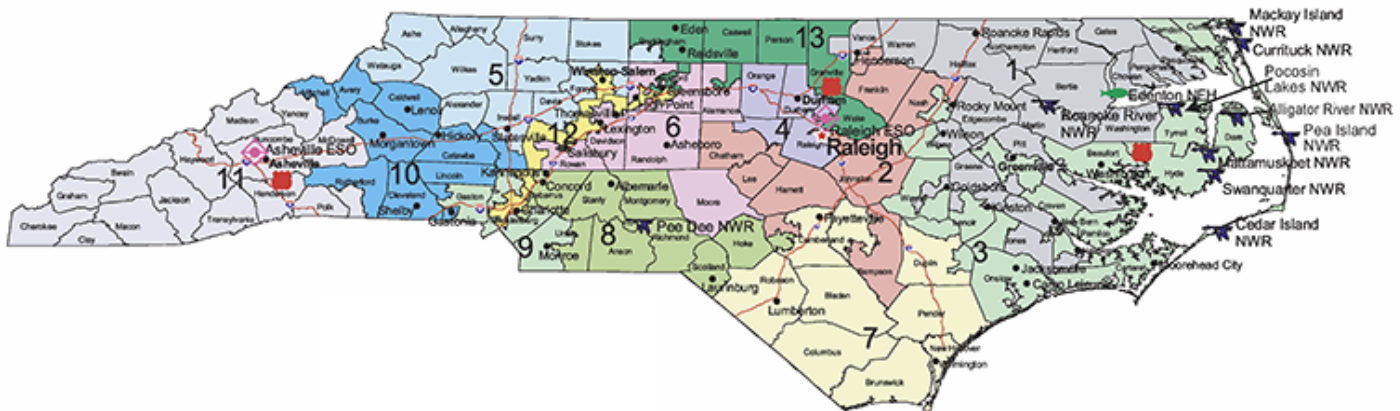


Mathematics and Gerrymandering Exploration

Name: \_\_\_\_\_

Step 1: Examine the NC congressional districts that were used in its 2012 election. Based on the shapes and what you know about the areas covered (e.g., demographic information about who lives in that district), do you believe gerrymandering occurred? Explain why or why not.

North Carolina Congressional Districts



(Source: <https://www.ncpedia.org/congressional-districts>)

Step 2: Below is data from the 2012 election in North Carolina. If you thought that North Carolina legislators engaged in gerrymandering prior to this election, would you say that they used the method of cracking or packing? How do you know?

District	Republican Votes	Democratic Votes
1	76,558	250,948
2	174,565	129,307
3	192,976	112,546
4	91,512	265,432
5	200,083	147,649
6	220,296	141,214
7	167,057	167,590
8	159,226	134,891
9	193,174	170,462
10	189,667	142,822
11	189,289	140,216
12	62,924	246,451
13	225,791	169,637

Step 3: Next, calculate the efficiency gap using the data.

District	Republican Votes	Democratic Votes
1	76,558	250,948
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Step 4: Stephanopoulos and McGhee—the political scientists who created the efficiency gap—suggest that there be a threshold of 8% for determining if a state's district maps are leading to wasted votes. How does North Carolina's efficiency gap compare to that threshold? Based on this, do you have evidence that North Carolina legislators may have drawn unfair maps?

Step 5: A question that many people have centers on the extent to which gerrymandering equates to a district looking "funny." You will receive a handout of a U.S. map with congressional districts drawn in. Use this handout to circle—based on your views and those of your partner—what looks to be the “most gerrymandered” district as well as the “least gerrymandered” district. Choose districts in other states in the country. Once you have circled the two districts, visit the site link below to find the state district map of the states your two districts are in; from there, write down the official district names below (e.g., NC District 12 and MI District 9).

[https://nationalmap.gov/small\\_scale/printable/congress.html#list](https://nationalmap.gov/small_scale/printable/congress.html#list)

District 1: \_\_\_\_\_

District 2: \_\_\_\_\_

Step 6: Next, calculate the efficiency gap for each of the two states, based on its 2016 district-level House election results. You will need to create a spreadsheet, or table by hand, that shows how you found the efficiency gap. You can find the data for this task by searching for “2016 House election results in \_\_\_\_\_,” inserting your state in the blank. For simplicity, only include data from Republican and Democrat voters. With the efficiency gap calculated, is there evidence that legislators—whether intentionally or not—have drawn district boundaries that lead to a large percentage of wasted votes? Why or why not?

Step 7: If you finish steps (1) through (6) before the rest of the class is ready to move on, visit the following link to explore another means of capturing if gerrymandering has occurred: the ["compactness" of districts](#). How does compactness compare to the efficiency gap? What makes the two measures similar or different in what they capture?