Utah Redistricting: A Simulation

Utah has 4 representatives in Congress. Deciding who votes in which district can be difficult. Simulate the process just using these 29 counties (no splitting) to get "even representation". Try first creating only **2** zones (or districts).

Tasks:

1. Explore the map of Utah with county boundaries and populations to learn about how interactive mapping tools can provide a platform for analysis.
2. Use the 2010 population (POP2010) data, whole counties (no sub-county levels), and ensure "contiguity" (no zones with parts that don't touch) to split the state into "nearly equal portions" (i.e. Congressional Districts).

Online Map Orientation:

1. In a browser, go to http://arcg.is/1v4Lmq.
2. Use the plus or minus tools to zoom in to see the entire state.
3. Click on **LAYER** ▤ tool and click on the "**...**" next to the USA Counties layer. Click on "View in Attribute Table". Close the **LAYER** ▤ tool.
4. In the **TABLE** ▭, click, "Filter by map extent", located at the top of the table to the left, to make sure all 29 counties are included (the words should turn from blue to black). Click on POP2010 column heading. You will see choices for "Sort ascending", "Sort descending", and "Statistics". Choose "Statistics".
   a. The "Number of values" is the number of counties in the state; the "Sum of values" is the total population.
   b. *How many people lived in Utah in 2010?* _____
5. In the **TABLE** ▭ at the bottom, click on POP2010 column heading again and choose "Sort descending".
   a. *Which county had the highest population in 2010?* _____
   b. Click on the small column before the county name to highlight it so you can see where that county is on the map.
6. After you see the county that you chose in the table highlighted on the map, click on "Clear Selection".
7. Now, at the top of the **TABLE** ▭, choose a column with ethnicity or age information; using what you learned above, briefly explore this data layer. Close the **TABLE** by clicking on ▭.

Now, begin the redistricting process for your state.

Activity:

1. The dots represent county population. Review the total population for the state (you recorded it earlier). *If you are dividing your state into two districts, how many people should be in each district?* _____

    Click the **LAYER** tool and then click on the layer name to open the legend to show county population numbers to understand what the dots mean. Close the **LAYER** tool.

2. Use the **SELECT** tool (it will automatically select by rectangle) to select counties on the map. Holding the SHIFT key adds new counties to the previously selected set of features. Holding down the CTRL (PC) or the COMMAND (Mac) key unselects counties one at a time. Instructions are also available by hovering over the **SELECT** tool.

3. While you are still in **SELECT**, once selection is made, use the "**...**" menu at right to click "Statistics"; change the "Field:" to Pop2010. Review how close you are to half the state population (see item 1. above). Keep selecting and unselecting contiguous counties and checking "Statistics" until you have chosen enough counties that add up to half of the population in Utah.

4. When you are satisfied with your selection, write down the Pop2010 number _____ and the number of counties (values) _____ for this zone before you create the layer. This will be your population for District 1.1.

5. Click the "**...**" menu to the right and click "Create layer". Name this layer District 1.1 and click on "OK". Close the **SELECT** tool.

6. Again, choose the **LAYER** tool and click the "**...**" menu to the right of your new District 1.1 layer. Choose "Transparency" and adjust transparency to approximately 25%. Click the **X** to close the box.

7. Open the **DRAW** tool and select the Text mode (**A**). Write the name of the district in "Text" and click on the map area you have created to display the label on the district.

8. Repeat steps 3 – 7 above to **SELECT** all of the counties that you did not select for District 1.1. Be sure and write down the Pop2010 _____ and the number of counties _____ for this zone. Check

to make sure the number of counties for this zone and District 1.1 add up to the total number of counties for the state and the total population of the state. Follow the instructions in item 6 above and name your new layer District 1.2. Change "Transparency" of District 1.2 to 50%. Change "Text:" to District 1.2 and click on the other area you have created. If by chance you have created a layer incorrectly, you will need to uncheck it in the **LAYER** list and create another two districts.

9. Prior to dividing your state into 4 zones, go into **LAYERS** and uncheck District 1.1 and District 1.2 layers and go into **SELECT** and click on "Clear" to start a fresh selection. Name these new layers, District 2.1, 2.2, 2.3, and 2.4. It is possible to duplicate county selections so be careful not to include any counties twice among your four districts.

10. For more extensive engagement with geospatial technology tools, use the **DRAW** tool to plan the regions OR draw around the regions after you have selected each one. (It can display area and perimeter or distance as well.)

11. Use the **TABLE** (pull up from the bottom) to display data. (Table options can expose/hide fields. Decide which ones to focus on.) Click on field headers to sort or access statistics.

Questions:
1. If you reviewed the historic population trends on the giant map of your state, does the online map look similar to the population distribution for 2010 on the giant map?
2. If you were on the 2020 redistricting team, what would your next step be?
3. What additional information do you need to complete the redistricting process for your state?

Extensions:
1. For each zone, compare data about the additional fields. (Table options can expose/hide fields.)
2. If you have completed the exercise with 2 and 4 districts, try more.
3. In the LAYER tool, you can also place a check in front of other columns to look at ethnicities while you select your regions.
4. Of these values – Equal Population, Contiguity, Compactness, Political Subdivision Splits, Communities of Interest, Competitive Elections, Minority Representation, Party Advantage – which ones are most important in guiding your decisions about drawing district lines.

Survey:
In order to understand how people are working with online mapping and redistricting, we are asking you to complete this brief survey after you have worked on the exercise.
https://arcg.is/1D8f9e

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