Counting Louisiana Parish Populations And Areas

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Teachers are always seeking situations in which mathematics can be connected to real world data. Regional geography provides one such context. The 64 parishes in Louisiana vary greatly in population, land area, and population density. An examination of Louisiana population and land area data, organized on a parish level, provides an interesting interdisciplinary project that can be adapted to a variety of middle school grade levels. In addition to increasing student awareness of the geography of this state, the suggested questions help students develop number sense and proportional reasoning. They also help students to see how to formulate questions that can be addressed with data, and how to collect, organize, and display this data to answer these questions (PSSM 2000, p248).

Table I is a listing of the population, land area (square miles), and "density" (population ÷ area) for each of the 64 parishes of Louisiana. The population and area data were found in **The World Almanac and Book of Facts 2001**; the densities were computed from the other data, using the formula $\text{density} = \frac{\text{population}}{\text{land area}}$. **1**

Table I

Parish	Population	Land Area (square miles)	Density (rounded to the nearest tenth)
Acadia	57,947	655	88.5
Allen	24,218	765	31.7
Ascension	74,049	292	253.6
Assumption	23,242	339	68.6
Avoyelles	40,710	833	48.9
Beauregard	32,265	1,160	27.8
Bienville	15,739	811	19.4
Bossier	93,374	839	111.3
Caddo	241,502	862	280.2
Calcasieu	180,607	1,071	168.6
Caldwell	10,469	530	19.8

Cameron	8,969	1,313	6.8
Catahoula	10,905	704	15.5
Claiborne	16,826	755	22.3
Concordia	20,572	696	29.6
De Soto	25,146	877	28.7
East Baton Rouge	393,294	456	862.5
East Carroll	8,719	422	20.7
East Feliciana	21,119	453	46.6
Evangeline	34,329	664	51.7
Franklin	21,993	623	35.3
Grant	19,211	645	29.8
Iberia	73,425	575	127.7
Iberville	31,357	619	50.7
Jackson	15,449	570	27.1
Jefferson	447,790	306	1,463.4
Jefferson Davis	31,423	652	48.2
Lafayette	187,403	270	694.1
Lafourche	89,463	1,085	82.5
La Salle	13,705	624	22.0
Lincoln	41,129	471	87.3
Livingston	91,182	648	140.7
Madison	12,987	624	20.8
Morehouse	31,242	794	39.3
Natchitoches	37,198	1,256	29.6
Orleans	460,913	181	2,546.5
Ouachita	146,672	611	240.1
Plaquemines	26,094	845	30.9
Pointe Coupee	23,440	557	42.1
Rapides	126,775	1,323	95.8
Red River	9,489	389	24.4
Richland	21,082	559	37.7

Sabine	23,812	865	27.5
Saint Bernard	65,406	465	140.7
Saint Charles	48,640	284	171.3
Saint Helena	9,607	408	23.5
Saint James	21,197	246	86.2
Saint John The Baptist	42,494	219	194.0
Saint Landry	84,243	929	90.7
Saint Martin	47,645	740	64.4
Saint Mary	56,795	613	92.7
Saint Tammany	192,945	854	225.9
Tangipahoa	98,285	790	124.4
Tensas	6,539	603	10.8
Terrebonne	105,128	1,255	83.8
Union	22,165	878	25.2
Vermillion	52,258	1,174	44.5
Vernon	51,567	1,329	38.8
Washington	43,162	670	64.4
Webster	42,797	596	71.8
West Baton Rouge	20,421	191	106.9
West Carroll	12,175	359	33.9
West Feliciana	13,833	406	34.1
Winn	17,498	951	18.4
Totals:	4,372,035	43,549	

Questions for your students based upon the data of Table I.

A. Rank order the 64 parishes by population. This activity can be done by hand or electronically. We will discuss several questions which address the distribution of population among these parishes.

1.Find the mean and median of the 64 parish populations. What does the inequality of these two measures tell about the skewness of the data? (Mean = 68,313.0; median = 31,844; skewed to the right.)

2.What is the smallest number of parishes needed to account for 1/2 of Louisiana's population of 4,372,035? (Eight parishes: Orleans, Jefferson, East Baton Rouge, Caddo, Saint Tammany, Lafayette, Calcasieu, and Ouachita.)

3.Fill in the blank with the largest possible number: Orleans parish has a larger population than the combined total of _____ of the smallest parishes. (The sum of the populations of the **27** smallest parishes is 445,381; this is just less than Orleans parish's population of 460,913.)

4.Redo problem 3 for the top two parishes - Orleans and Jefferson. (The smallest 40 parishes are needed.)

B.Rank order the 64 parishes by land area.

1.Find the mean and median of the 64 parish land areas. What does the inequality of the two measures say about the skewness of data?

(Mean = 680.5; median = 646.5; skewed slightly to the right.)

2.What is the smallest number of parishes needed to account for 1/2 of Louisiana's total land area of 43,549 square miles? (22 parishes are needed -- from Vernon to Tangipahoa.)

3.Fill in the blank with the largest possible number: Vernon has a larger land area than the combined land areas of the _____ smallest parishes. (The sum of the land areas of the **5** smallest parishes is 1,107 square miles, just less than the land area of Vernon, which is 1,329 square miles.)

4.Redo problem 3 for the top two parishes in land area; these are Vernon and Rapides. (9)

C.Rank order the 64 parishes by density (population ÷ land area).

We will consider several questions to dramatize the significance of the density differences among parishes. Ratio and proportions will be problem solving tools.

1.Find the total population and area of the four most densely populated parishes. (Orleans, Jefferson, East Baton Rouge, and Lafayette have a total population of 1,489,400 and a total land area of 1,213 square miles.)

2.What is the density of the four-parish group? (1,489,400 ÷ 1,213 = 1,227.9)

3.If the entire state of Louisiana were as densely populated as this four-parish group, what would be the state's population?

($\frac{1,489,400}{1,213}$ **2=** $\frac{x}{43,549}$ **3; x = approximately 53,500,000. This is approximately the combined populations of Alabama, Florida, Georgia, Mississippi, South Carolina, and Texas.**

4.If the entire state of Louisiana were as densely populated as its four least densely populated parishes, what would be the state's population? (Total population = 43,911, total land area = 3,571 square miles; $\frac{43,911}{3,571}$ 4= $\frac{x}{43,549}$; 5x = approximately 530,000. This is smaller than the population of the sparsely populated state of North Dakota.)

5.If the United States were as densely populated as Louisiana's four most densely populated parishes, what would the population of the United States be? (Since the total land area of the United States is 3,536,278 square miles, we must solve the following equation: $\frac{1,489,400}{1,213}$ 6 = $\frac{x}{3,536,278}$ 7; x = approximately 4,130,000,000. Compare this to the population of the entire world.

6.If the United States were as densely populated as Louisiana's four least densely populated parishes, what would the population of the United States be? ($\frac{43,911}{3,571}$ 8= $\frac{x}{3,536,278}$ 9; x = approximately 43,000,000. This is approximately 1/6 the population of the United States.)

Extensions and Challenges:

1.Students may make histograms and boxplots to show the distributions of the three variables -- population, area, and density.

2.A similar analysis may be performed on data for the fifty states. Sample questions could include figuring out how many people would live in the United States if every state had the same density as New Jersey or Alaska.

3.The presidential election in 2000 provides an opportunity to study population distribution since electoral votes are assigned to each state based on the number of residents. Candidates typically concentrate on a few states with largest number electoral votes. Students could be asked to find the largest number of states whose electoral votes, combined, equal or exceed those of the top three -- California, Texas, and New York.

4.The distribution of population among countries of the world and the issue of population growth may be explored.

5.The concept of population density may be extended to the physical sciences, where density is defined as mass per unit volume.

6.Readers are invited to discover other uses of this data set and additional situations in which data can be analyzed in a similar manner.

References:

The World Almanac and Book of Facts 2001, World Almanac Books.

Principles and Standards for School Mathematics, National Council of Teacher of Mathematics, 2000.

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