PROBLEM-SOLVING PRACTICE VIA STATISTICAL DATA

K. Allen Neufeld

University of Alberta
Edmonton, Alberta

The activities reprinted here have been selected from a booklet which is available from the author and editor of this Monograph.

ETHNIC POPULATION

(Addition and Subtraction of Whole Numbers)

1. The table below gives the numbers of people of differing ancestry (distribution of population by ethnic origin) for Canada in 1971.

British	9	624	120	Polish	316	425
French	6	180	120	Native Indian and Eskimo	312	765
German	1	317	200	Jewish	296	940
Italian		730	820	Asiatic	285	540
Ukrainian		580	655	Russian	64	475
Netherlands		425	945	Others	1 046	510
Scandinavian		384	795		

    Find the total population of Canada in 1971.

2. Choose the three groups from the following four which together have a total population closest to that of the German group: Ukrainian, Italian, Netherlands, and Scandinavian.

3. Choose the two groups from the Polish, Native Indian and Eskimo, Jewish and Asiatic groups which together have a total population closest to that of the Ukrainian group.

4. How many more are there of British and French ancestry than of all others combined?
    Hint: Look for a shortcut using the total population.

5. Twelve groups are listed by name in the table. What is the difference between their total and the total of those listed as "Others"?

6. Except for "Others," the groups are listed in decreasing order. Name the two consecutive groups whose difference from one another is the least.

7. Excluding the first three groups and the "Others," name the two consecutive groups whose difference is the greatest.

8. Try to find the distribution of population by ethnic origin for your province. Arrange the population in decreasing order of numbers. Is the order different from that given in the table?

TRAFFIC INJURIES AND DEATHS

(Division of Whole Numbers)

1. The chart gives the population and number of traffic injuries in one month for four Alberta cities and towns. The figures are for 1968.

City	Population	Traffic Injuries
Edmonton	376 925	184
Calgary	330 575	223
Lethbridge	37 186	16
Red Deer	26 171	7

   We can show how safe or dangerous each city or town is by saying that one person was injured out of each set of n inhabitants

   For Red Deer   26 171 ÷ 7 = 3738.7

   1 person was injured out of every 3 739 inhabitants.
   We could call this number a monthly personal safety index.
   Compute this index for the other cities and towns.
   Which was the safest? Which was the most dangerous?

2. Obtain the data on traffic injuries and deaths for each month in cities and towns near you.
   Compute the monthly personal safety index for each city or town.
   Compute an annual personal safety index also.
   Is any month especially dangerous?

3. Insurance companies use indexes like these to set automobile insurance rates. This chart shows the populations, the number of traffic deaths and drivers in some states of the U.S.A. and provinces of Canada.

   Compute a personal safety index and a driver safety index for each.
   Where do you think insurance rates might be highest? Lowest?

State or Province	Population	Number of Traffic Deaths	Number of Automobiles
British Columbia	2 067 143	542	811 590
California	19 953 134	5 080	11 646 000
Hawaii	769 913	133	501 179
Missouri	4 677 399	1 528	2 568 633
Newfoundland	514 394	96	102 295
New York	18 190 740	3 164	8 055 785
Ontario	7 684 658	1 667	2 864 979
Texas	11 196 730	3 551	6 380 057
Utah	1 059 273	308	615 0.4
Wisconsin	4 417 933	1 142	2 459 539

4. Find more recent data for your own province or state. How does it compare with the data above?

POPULATION CHANGE

(Addition and Subtraction of Decimals)

Complete the chart on population change for Canada from 1861 to 1971. All figures are in millions. In some cases you will be adding and subtracting positive and negative numbers.

	1861-1871	1871-1881	1881-1891	1891-1901	1901-1911	1911-1921	1921-1931	1931-1941	1941-1951	1951-1961	1961-1971
(P) Population at Beginning of Period	3.23	3.69									
(A) Births	1.37	1.48	1.54	1.55	1.93	2.34	2.42	2.29	3.19	4.47	4.11
(B) Immigrants	0.19	0.35	0.90	0.33	1.76	1.61	0.20	0.15	0.55	1.54	1.43
Total "Arrivals" A + B	1.56										
(C) Deaths	0.72	0.75	0.82	0.83	0.81	0.99	1.06	1.07	1.21	1.32	1.50
(D) Emigrants	0.38	0.44	1.12	0.51	1.04	1.38	0.97	0.24	0.38	0.46	0.53
Total "Departures" C + D	1.10										
Net Increase (A+B) - (C+D) = N	0.46										
Population at End of Period P + N	3.69										
Natural Increase A - C	0.65										
Immigration - Emigration Increase B - D	-0.19										

PRECIPITATION AND SUNSHINE

(Division of Decimals)

1. Copy and complete this chart for precipitation and sunshine for Inuvik. The first line has been completed. Check it carefully.

Month	Monthly Average		Daily Average	
	Precip. (mm)	Sunshine (h)	Precip. (mm)	Sunshine (h)
January	20.3	9.3	0.7	0.3
February	10.4	67.6		
March	16.5	173.1		
April	14.0	254.3		
May	17.5	288.9		
June	13.0	365.7		
July	34.3	314.0		
August	46.2	208.4		
September	21.1	110.1		
October	33.8	53.4		
November	14.7	19.1		
December	18.5	0		
Annual				
Average				

2. On the average, Sept Iles, Quebec, has a total annual snowfall of 423.2 cm. This is the highest average for any city or town in Canada. The lowest average is at Estevan Point, British Columbia, with 34.3 cm. How many times greater is Sept Iles' average than Estevan Point's average?

3. Estevan Point has an average total rainfall of 2993.6 mm per year. The lowest average is at Alert in the Northwest Territories, with 11.4 mm. How many times greater is Estevan Point's average than Alert's average?