

WHO SERVES?¹

A Comparison of the Demographics in the Military and the General Population



For a longer, more detailed version of these lessons, or for charts with more data/variables, see:
<http://www.radicalmath.org/main.php?id=military>

Overview:

This multi-step activity asks students to compare demographic data of people in the military with demographics of the Zip Code or State where they are from. The goal is to look for any disproportionate relationships within the data, and to discuss possible causes and consequences for the imbalances. There is a variety of math that can be used in this lesson, but the focus is on data analysis through mapping, graphing, and statistical computations.

This lesson can be done using Microsoft Excel or by hand.
Time Length: Approx. 2 - 6 hours, depending on depth of work

Focus Question:

Do the demographics of the military population fairly reflect the demographics of the U.S. and Brooklyn, New York populations?

¹ These materials were developed for “*Camouflaged: An Investigation into how the U.S. Military Affects You and Your Community*”, a curricular resource guide designed by the New York Collective of Radical Educators - <http://www.nycore.org>

Suggested Procedure:

1. Pass out to students either (or both) the lists(s) called "Data Categories for Comparison". This is a list of the data that is available for students to compare during this activity.
2. Begin by picking one set of data from each of the main categories (Demographic Data and Military Data) and then discussing with students which categories of data they think might be related, and what type of relationship they would have. For example, you can ask them to make a guess about the demographics of those areas that have higher numbers of army recruits (Military Data), such as: "*What type of unemployment levels do you think they will have? Income levels? Percent people of color?*" Or you can start with areas that have, for example, higher median income (Demographic Data), by asking: "*Will they also have a higher percent of people in the military than poorer areas?*"
3. Make sure to discuss *why* students made the predictions that they did, and have them explain their reasoning behind these predictions.
4. Have students identify the two categories (one from each section) that they think there will be the strongest relationship between.
5. Pass out the charts with the actual data to students ("Brooklyn Military Data" and/or "U.S. Military Data"), and have them locate the two categories that they had identified. The charts can also be downloaded in Excel format, as can charts with many more data categories, from <http://www.radicalmath.org/main.php?id=military>
6. Students should use any or all of several methods to actually determine the relationship between the categories they've chosen. To see examples of each, visit: <http://www.radicalmath.org/main.php?id=military>.

*** Note On Data/Definitions: The "Hispanic" category includes all people of Hispanic descent. I use the terms Hispanic and Black because this is the terminology used by the Military and by the US Census. The "Percent People of Color" category was calculated by subtracting the percent of "White Only, Non Hispanic" people from the total population. Some data is off due to rounding errors. There may also be some overlap between Hispanic and Black.*

The following options are ordered from easiest to most difficult.

OPTION 1: Pie Graphs

- a. Students are given data on the Percent Hispanic, Black, and People of Color in each area. Have them come up with a method to determine the Percent White and the Percent of other Ethnic People (non Hispanic or Black), focusing in on one State or one Zip Code, for both the military and general population demographics (by subtracting the percent Blacks and Hispanic from the Percent People of Color categories).
- b. Have them make two pie graphs, one for the Military and one for the General Population for the State or Zip Code they chose, looking at these four Racial groups, and then compare the two graphs.

OPTION 2: Two Maps, Two Categories

- a. Sort each category of data chosen from lowest to highest and keep track of the values that correspond with each Zip Code or State.
- b. Divide all the data into 5 groups with an equal number of Zip Codes or States in each group
- c. Assign each group a color using a range of similar colors from light to dark, and shade in the areas on the map based on their color (additional maps of other geographic areas can be downloaded from <http://www.radicalmath.org/main.php?id=military>).
- d. Have repeat this process for the second set of data, and then compare the two maps

OPTION 3: One Map, Two Categories (Overlay Map)

- a. Make one map as described above
- b. Sort the data from the second category as described above.
- c. Locate the 2 end-groups with either the highest or lowest data
- d. On the first map, draw dashed-lines over the areas located in the groups from Step 3. This is called an Overlay Map, and will allow you to compare the first category of data with the extremes from the second category of data. (See: Sample Map #1)

OPTION 4: Scatterplot Graphs

- a. Graph the data from the two chosen columns of data by making a Scatterplot graph. I suggest using the Military data for the X-axis, but either type of data could be considered the Independent variable in this activity
 - b. Estimate or determine the Line of Best Fit (the Regression Line) and find the values for r and r^2 . This can be done by hand, or by using a Calculator or Microsoft Excel.
 - c. There should be a linear relationship between the variables, but students can test different types of regression lines to see which has the largest r^2 value (and is therefore the best fit for the data).
 - d. Depending on what you've already covered in class, you can also discuss how to remove possible outliers from the data.
 - e. Another way to interpret the data on the Scatterplot Graphs is to find (by hand, or on Excel) the equation that best fits the data, and to discuss what the equation means about the two categories. (See: Sample Graph #1 below)
7. After you have worked with students to discover the type and strength of the relationships between different categories of data, revisit their original predictions. Discuss how accurate their predictions were, and why they might have been wrong/right.
 8. Compare different students' maps, graphs, or values for r and r^2 and discuss the results.

9. Make sure to discuss that proving the existence of a relationship between two categories does not prove a cause-and-effect relationship. Also, make sure students understand that it is important to compare many different categories to make general statements about the data. So, for example, they should understand that just because there may be a relationship between States with a high percent of poor people and a high percent of people in the military, that poverty is only of many reasons why people join the military.

Data Categories for Comparison

Military Data

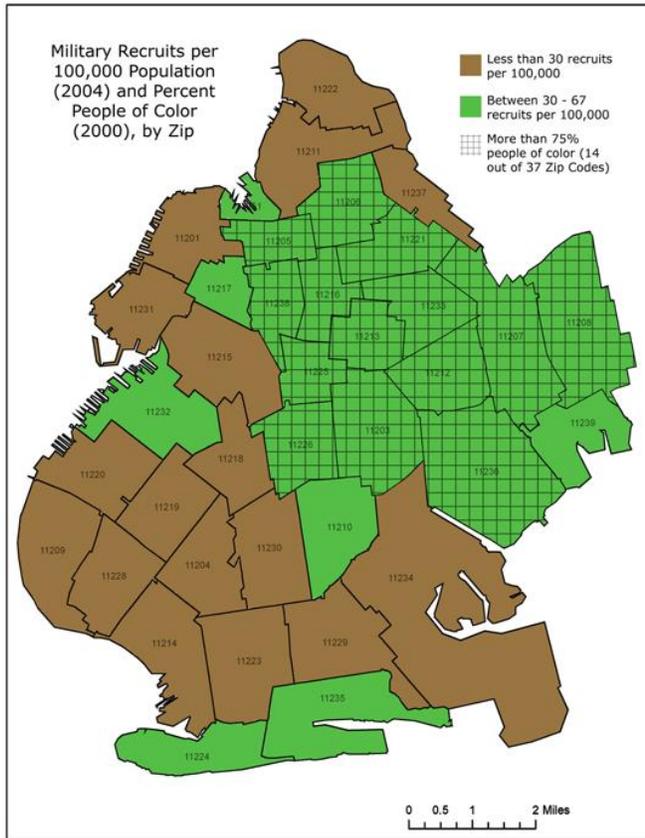
- Percent of Total Persons in Military (2004)
- Percent of All Military Recruits by Area (2004)
- Percent of U.S. Military, Black (2003)
- Percent of U.S. Military, Hispanic (2003)
- Percent of U.S. Military, People of Color (2003)
- Military Recruits, Percent Hispanic (2004)
- Military Recruits, Percent Black (2004)
- Military Recruits, Percent People of Color (2004)
- Percent of Total U.S. Casualties in Iraq as of 5/30/06 (States Only)
- Military Recruitment Stations (Brooklyn Only)

Demographic Data

- Percent of Total Area Population (2005)
- Median Household Income (2002 - 2004 Average)
- Unemployment Rate (2006)
- Area Population, Percent Hispanic (2000-5)
- Area Population, Percent of Black (2000-5)
- Area Population, Percent People of Color (2000-5)

Sample Work

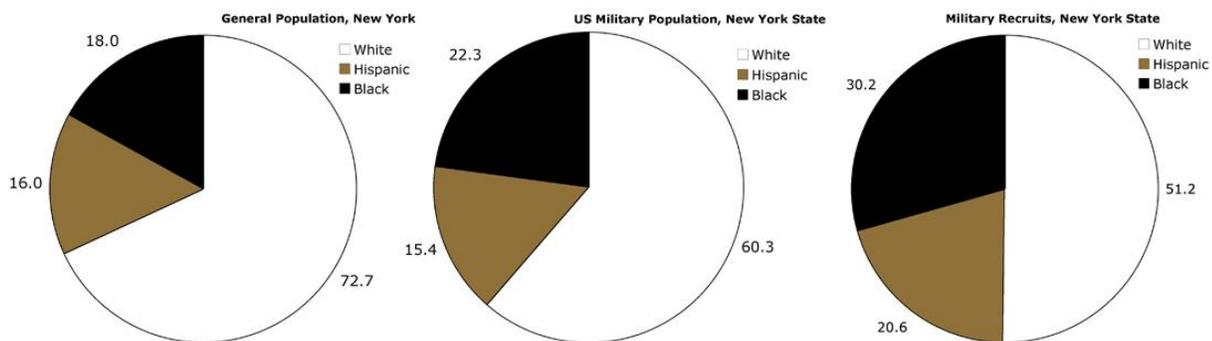
Additional work, as well as full-resolution images of the following, can be downloaded from www.RadicalMath.org



Sample Map

The data on the number of Military Recruits per 100,000 by Brooklyn Zip Code was divided into two groups, with half of the Zip Codes falling into each group (0 - 30 and 31 - 67). Then an overlay was placed over all of the Zip Codes whose populations have more than 75% people of color. The resulting graph clearly shows that not only is there a geographic bunching of neighborhoods with higher rates of recruits, but also a relationship between neighborhoods with higher rates of recruits and those with a majority of people of color.

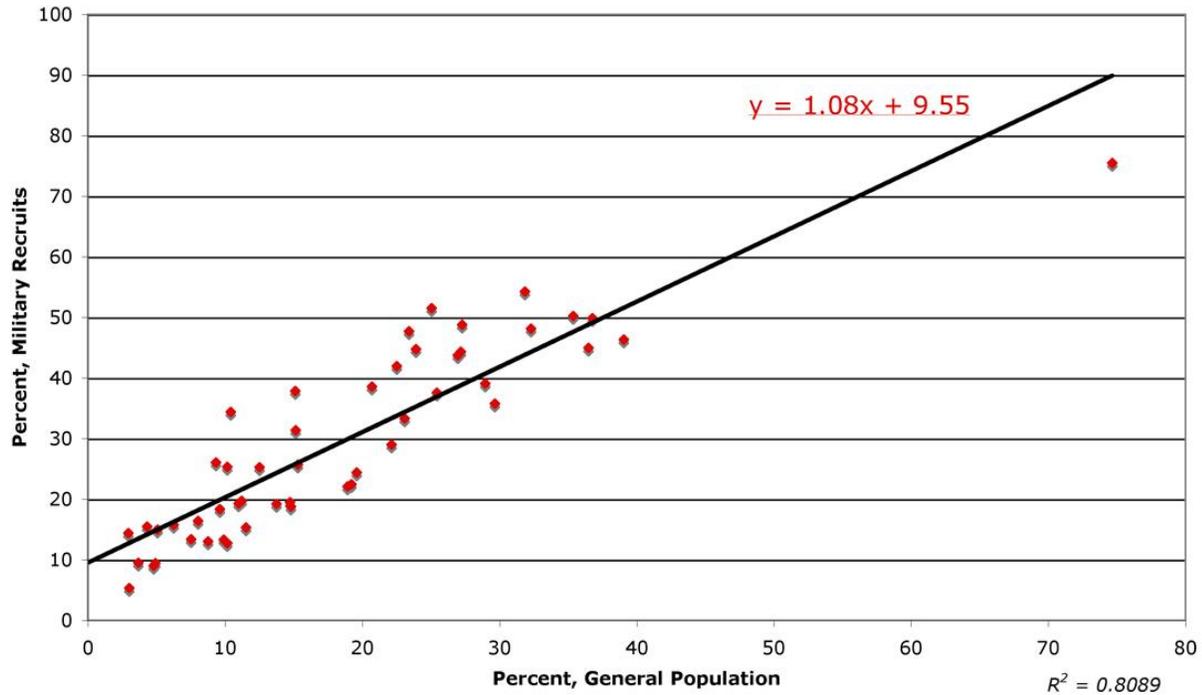
Sample Pie Graphs



It is evident from looking at these Pie Graphs that in New York State, for example, there is a much higher proportion of people of color either in or being recruited for the Military than there is in the general population.

Sample Scatterplot Graph:

Comparison of Military Recruits and General Population, Percent People of Color, by State



This is a graph comparing the percent of the general population and the percent of military recruits that are people of color. The equation for the Line of Best Fit indicates that on average, the percent of military recruits who are people of color are almost 10% higher than the percent of the general population who are people of color. For example, in Alabama, where 29% of the population is people of color, 43.3% of military recruits are people of color.

Glossary:

- **Scatterplot Graph:** is a graph used in statistics to visually display and compare two or more sets of related quantitative, or numerical, data by displaying only finitely many points, each having a coordinate on a horizontal and a vertical axis.
- **Overlay Map:** The process of superimposing two or more maps, through registration to a common co-ordinate system, such that the resultant maps contain the data from both maps for selected features.

Data Sources:

- 1 - Bureau of Labor Statistics
www.bls.gov
- 2 - US Census
www.census.gov
National Race Statistics (2004): SC-EST2004-04
- 3 - National Priorities Project
www.nationalpriorities.org
- 4 - Department of Defense
http://siadapp.dior.whs.mil/personnel/CASUALTY/STATE_OEF_OIF.pdf
- 5 - DOD's Selected Manpower Statistics FY 05
<http://web1.whs.osd.mil/mmid/M01/fy04/m01fy04.pdf>
- 6 - Peaceworks Magazine Online
www.afsc.org/peacework
- 7 - InfoShare Online
www.infoshare.org
- 8 - The New Yorkers' Guide to Military Recruitment in the 5 Boroughs -
www.CounterRecruitmentGuide.org
- 9 - Population Representation in the Military Services
<http://www.defenselink.mil/prhome/poprep2003/index.html>

Key Standards Addressed

From the NCTM Data Analysis and Probability Standard for Grades 9–12

- Understand histograms, parallel box plots, and scatterplots and use them to display data;
- For bivariate measurement data, be able to display a scatterplot, describe its shape, and determine regression coefficients, regression equations, and correlation coefficients using technological tools;
- Understand how sample statistics reflect the values of population parameters and use sampling distributions as the basis for informal inference;
- Evaluate published reports that are based on data by examining the design of the study, the appropriateness of the data analysis, and the validity of conclusions;