



Middle Grades Proportional Reasoning

Relatively, Where are the Most Cases of COVID-19?

The number of COVID-19 cases is rapidly changing daily in many different countries around the world as well as in the different states in the United States. Such news headlines are quick to tell us where the highest number of cases are present:

[Coronavirus: US overtakes China with most cases](#)

[Why New York is the epicenter of the American coronavirus outbreak](#)

[US has more known cases of coronavirus than any other country](#)

Many questions center around these headlines such as the number of cases reported, how the number of actual cases may differ from the number of cases reported, as well as the support and infrastructure available to different communities. For now, let's focus on one question, such as:

Have you wondered how the number of reported cases compares to the total population of a country or state?



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Task 1

How Many More Cases Does the United States Really Have?

On March 27, 2020 it was reported that the United States surpassed China in the number of reported cases. At one point during that day, one article above reported the United States had at least 82,100 cases while China was reporting 81,782. However, the total population of the United States is approximately 330,000,000 while the total population of China is approximately 1,400,000,000. Proportionally speaking, quantify the number of cases in the United States as compared to China for March 27. Show your thinking below.

Take some time to research and explore how cases geographically spread in the United States compared to China. Consider the density of spread and the size of both the United States and China. What did you learn from this research? How does this information, mathematically speaking, weigh into your interpretation of your response to the previous question?



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Task 2

Which State, Proportional to its Population, has the Most Cases?

Begin by using real-time data regarding the number of cases in each state, such as found on CDC's website: [Cases in U.S.](#) Given the number of cases on the U.S. map shown on this website, research the total population of given states and determine those with a relatively high number of cases.

Consider the following questions:

1. When accounting for the population of each state, which 3 states have the highest proportion of cases? What are their number of cases (could be reported per 100k)? Show your thinking.
2. When accounting for the population of each state, which 3 states have the lowest proportion of cases? What are their number of cases (could be reported per 100k)? Show your thinking.
3. Discuss a state that appears to have a low number of cases, but a high number of cases proportionally. Justify your thinking using mathematics. What are some characteristics of this state (region of the country, population density, etc.) in relation to other states that have a similar *proportionally high* number of cases with a low number of total cases?
4. Describe a state that appears to have a high number of cases, but a low number of cases proportionally. Justify your thinking using mathematics. What are some characteristics of this state (region of the country, population density, etc.) in relation to other states that have a similar *proportionally low* number of cases with a high number of total cases?