

National Teacher's Association  
1090 Appleton Ave  
Phoenix, AZ 85004

Independent Mathematical Contractors  
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Anytown, Anystate 00000

Dear IMC:

As you know, the popular media has been popularizing the idea of a crisis in education. Our impression of the situation is that there is a shortage of teachers nationwide that is contributing to the poor performance on national tests nationwide. We believe that more teachers in the classroom will enhance student performance on these tests and have evidence to support this assertion. The National Education Association agrees with this position and recommends a student to teacher ratio of 15 to 1. Our concern is the number of teachers is not increasing fast enough to keep up with the increasing number of students. Our organization would like to commission you to research this question for us. We'll provide you with some basic data about students and teachers in the US and in individual states. Each of you has been assigned a state and will compare the trends in that state and the nation to the recommended level. In particular, we need to know when the trend describing the student to teacher ratio in the state you have been assigned will be equal to the NEA recommended ratio. We would also like to know when the national student to teacher ratio will be equal to the NEA recommended level.

Attached are two tables containing the number of teachers and students nationwide and in each state. In each of these tables you'll find your name corresponding to the same state. This is the state you'll be researching. The data spans the time period from 2000 to 2006, the most recent data available.

To solve the problem outlined above, we anticipate that you'll need to complete the following steps.

1. Find the student to teacher ratio in each year for your state and in the nation. To do this you'll need to divide the number of students by the number of teachers in each year.
2. Using the student to teacher ratios, complete a table with three columns. In the first column list the years (align as years since 2000). In the second column list the corresponding student to teacher ratios for your state. In the third column list the national student to teacher ratios.
3. Enter the table into your calculator as three lists.
4. Make a scatter plot with the aligned year data graphed horizontally and the national student to teacher ratio graphed vertically.
5. Find the best linear function that corresponds to this graph using the least squares line.
6. Find the year in which the national student to teacher ratio is equal to the NEA recommended level of 15 students per teacher and verify it graphically.
7. Make a scatter plot with the aligned year data graphed horizontally and the state student to teacher ratio graphed vertically.
8. Find the best linear function that corresponds to this graph using the least squares line.
9. Find the year in which the state student to teacher ratio is equal to the NEA recommended level of 15 students per teacher and verify it graphically.

We look forward to your technical memo on this matter. Each of you should document the trends of a single state and the nation and compare it to the NEA recommended level. Include in your technical memo graphs prepared with Excel that reflect the scatter plots on your calculator. A scientific expert (your instructor) is available to answer any questions that you might have in the course of your

investigations. You should consult with this expert as needed. This expert will not be available to assist on this project over the weekend before it is due.

Sincerely,  
Alvin Knoitall , Executive Director, NTA