

Summary of School Improvement Plan

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Solution: The biology department will receive 3 additional teachers, while the art, music, english, and social studies departments will each receive 1 additional teacher.

Overview: The Pythagoras' School of Mathematics, Science, and Technology would like to accommodate more students. As a result, the school will hire seven additional faculty members. We must distribute the teachers in a fair and efficient manner to certain departments.

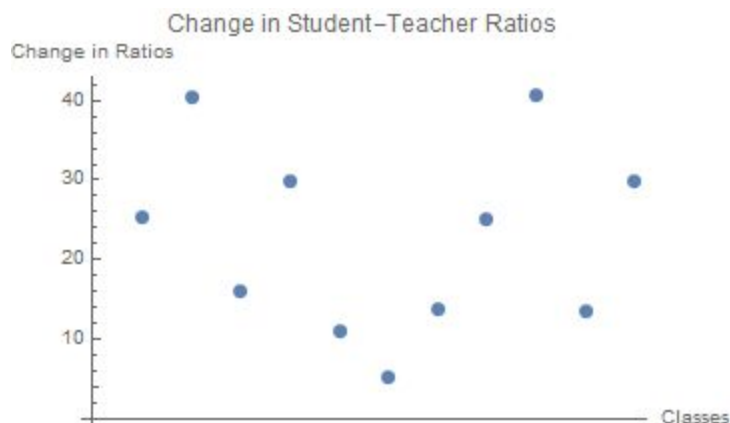
Givens / Assumptions:

- The incoming class will have the same distribution of class enrollments in each grade as the current class in that grade
- Each teacher teaches every grade
- The existing teachers will not take on more classes

Methodology: We first determined the number of students currently enrolled in the tenth grade class. Each year, 5% of the students drop out, and the total number of students in the school is 490. $x + \frac{95}{100}x + \left(\frac{95}{100}\right)^2x = 490$. We then calculated the enrollment rate of each class. For example, the art class, which has 31 of the 171 students, has an 18.05% enrollment rate. Using this value, we can calculate the estimated enrollment of the 140 additional students. The art class will receive an *extra* 25 or so students next year, so the total enrollment will be approximately 56 students. In order to maintain fairness in the distribution of seven new teachers, we calculated the student-teacher ratios *with* and *without* the additional incoming students. The new and current student-teacher ratios are respectively:

$$\frac{\left(\frac{\text{currentEnrollment}}{\text{totalStudents}} * 140\right) + \text{currentEnrollment}}{\text{departmentFaculty}} \quad \frac{\text{currentEnrollment}}{\text{departmentFaculty}}$$

The classes with the largest increase in student-teacher ratio would receive additional faculty. Teachers were added one by one, and the values were recalculated with each additional teacher.



Conclusion: With additional time, we plan on incorporating the remaining grades to determine which department would most need through the coming years.

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