THE EPSILON SCHOOL MANAGEMENT PLAN

BY: ANDREY, CAROLINE, GRACE

WHAT'S THE PROBLEM?

SINCE 140 NEW STUDENTS ARE JOINING THE SOPHOMORE CLASS, THE EPSILON SCHOOL WAS FORCED TO HIRE 7 MORE TEACHERS. HOWEVER, WHERE SHOULD THE EXTRA 7 TEACHERS GO?

HERE'S OUR SOLUTION.

ORIGINAL DATA

Department	#of Teachers	10th	11th	12th	Total
German	1	19	22	10	51
Art	1	31	33	35	99
Spanish	1	51	26	33	110
French	1	41	32	49	122
Music	1	50	56	49	155
Physics	3	50	58	183	291
Chemistry	3	59	126	109	294
Biology	4	198	95	26	319
Social Studies	5	173	137	59	373
English	5	183	155	152	490
Math	6	184	201	262	647
Total Students		183	155	152	490

ENROLLMENT AND DROP OUT RATES

Assumption # 1:

The ratio of students enrolled in class types will remain the same in each grade, and new enrollments will be rounded.

Total number of students in each grade

Department	10th	11th	12th	Total
English	183	155	152	490

Total Students		183	155	152	490
5% drop out		-6	-3	0	9
Next Year		301	177	152	630
		152+140+9(people drop out)			

Assumption # 2:
People only drop out in the summer

Assumption # 3:
- Roughly 66% of 5% of people drop out from 10th to 11th grade.

- Roughly 33% of 5% of people drop out from 11th to 12th grade

This will total roughly 5% of dropouts

OUR MODEL + METHODS

Department	OG #of Teachers	10th	11th	12th	Total	Teacher Ratio (original)	Teacher Ratio (new)	New teachers?	Total Teachers
German	0.6	31	25	10	66	110	82.5	0.2	0.8
Equation					Sum of students enrolled in department	Total Students Enrolled/number of teachers in department originally	Total Students Enrolled/number of teachers in department with new teachers		

NEXT SCHOOL YEAR

Department	#of Teachers (before)	10th	11th	12th	Total
German	0.6	31	25	10	66
Art	1	51	38	35	124
Spanish	1.2	84	30	33	147
French	1.2	67	37	49	153
Music	1	82	64	49	195
Physics	3	82	66	183	331
Chemistry	3	97	144	109	350
Biology	4	326	108	26	460
Social Studies	5	285	156	59	500
English	5	301	177	152	630
Math	6	303	230	262	795
Total Students		301	177	152	630

TEACHERS

Ratios were found by dividing the total number of students enrolled in a class within that department by the number of teachers

We found the ideal teacher-student ratio possible:
total students divided by the total number of teachers and got 98.711 students/teacher

Department	Teacher Ratio (original)	Teacher Ratio (new)	New teachers?	Total Teachers
German	110	82.5	0.2	0.8
Art	124	124	0	1
Spanish	122.5	91.875	0.4	1.6
French	127.5	95.625	0.4	1.6
Music	195	97.5	1	2
Physics	110.3333333	110.3333333	0	3
Chemistry	116.6666667	87.5	1	4
Biology	115	92	1	5
Social Studies	100	100	0	5
English	126	105	1	6
Math	132.5	99.375	2	8
Total:	N/A	N/A	7	38

What is fair?

Assumption #4:

Merriam-Webster: marked by impartiality and honesty: free from self-interest, prejudice, or favoritism

https://www.merriam-webster.com/dictionary/fair

CLASS ASSUMPTIONS

Assumption #5: There is only one art teacher because art classes do not require a significantly low student-to-teacher ratio

Assumption #6: Each teacher teaches 5 classes

Assumption #7: Each teacher's class size should be approximately the same, so the ratios should be similar

Assumption #8: Each teacher will be able to handle their class size and workload

Assumption #9: The classes taught will stay the same. No new classes will be added and no existing classes will be dropped

FOREIGN LANGUAGES

- Assumption #10: All foreign language teachers can teach two languages
- Assumption #11 : 0.2 of a teacher is one class taught.

Before:

Language teachers		
Teacher 1	German (0.4)	French (0.6)
Teacher 2	German (0.2)	Spanish (0.8)
Teacher 3	French (0.6)	Spanish(0.4)
New Teacher	Spanish	French

Number of (new) students enrolled in a foreign language
366 Students
Old teacher ratio with new number of students
366/3=122

After:

Language teachers		
Teacher 1	German (0.6)	French (0.4)
Teacher 2	German (0.2)	Spanish (0.8)
Teacher 3	French (0.6)	Spanish(0.4)
New Teacher	Spanish(0.4)	French(0.6)

Number of (new) students enrolled in a foreign language
366 Students
Old teacher ratio with new number of students
336/4=91.5

JUSTIFICATION AND FUTURE YEARS

- Because every 3 years there will be one exceptionally larger class, the numbers of Chemistry, Biology, and Physics teacher's numbers will need to be shuffled around
  - When an exceptionally large class is in 10th grade, extra biology and chemistry teachers will be necessary
  - When it's in 11th grade, extra chemistry and physics teachers will be needed
  - When it's in 12th grade, extra physics and biology teachers are necessary

STRENGTHS AND WEAKNESSES

Strengths	Weaknesses
This model keeps the per class student to teacher ratio no more than 1:25	Teachers will need to cycle depending on which part of the 3-year cycle you're on
Most classes are around a ratio of 1:20	Language teachers will have to teach two separate languages
Teacher allocation is based on student interest	The art teacher has the least fair ratio (within reason)
All the teachers are used to their maximum capabilities	Teachers may be just a tad overworked!

Thank you for listening!

01

Thank you to Merriam-Webster for defining the word fair

02

Thank you to everyone who participated!

03

Thank you to Ms. Burns who gave us this spectacular problem

04

Thank you to MAMS who provided the incredible software used


ANY QUESTIONS?