

Epsilon School

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01 Introduction

- The student population in the Epsilon School is increasing from 490 to 630 people in the 2024-2025 school year.
- There will be seven additional faculty members added
- The goal of this question was to determine which departments deserved the extra teachers.

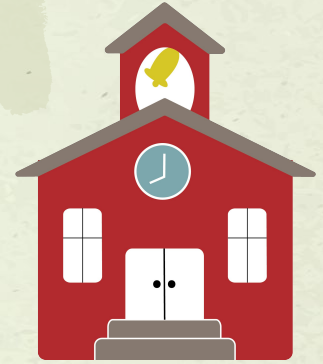
Department Enrollment Totals

6	Mathematics faculty	5	English faculty
3	Chemistry faculty	3	Foreign language faculty
3	Physics faculty	1	Music instructor
4	Biology faculty	1	Art instructor
5	Social studies faculty		

Departmental Enrollment Totals in 2023

Department	10th	11th	12th	Total
Art	31	33	35	99
Biology	198	95	26	319
Chemistry	59	126	109	294
English	183	155	152	490
French	41	32	49	122
German	19	22	10	51
Spanish	51	26	33	110
Mathematics	184	201	262	647
Music	50	56	49	155
Physics	50	58	183	291
Social Studies	183	131	59	373

02 Assumptions



Assumption 1) English is our baseline

English	183	155	152	490
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Assumption 2) Dropout rates aren't negligible

Assumption 3) All the lang teachers can teach 2 different languages

Assumption 4) Math is a required class and students can double up on it

Mathematics	184	201	262	647
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Assumption 5) The students in the entering sophomore class will sign up for the same classes as the previous students (interest ratios won't change)

03 General Methods

1. Find percentage of students (after dropout) in 24–25 school year compared to 23–24 school year.
2. Multiply ratio by number of courses taken per grade in 23–24 school year.
3. Find predicted percentage of classes taken in each department in 24–25 school year.
4. Compare with current teacher distribution in each department.

04 Testing Our Methods

$f_x = 183 \cdot (0.995)$								
	O	P	Q	R	S	T	U	V
1			Sophomores	Juniors	Seniors	Total		
2	23-24	before d.o.	183	155	152	490	(english students)	
3		after d.o.	182.09	151.9	148.2	482.185		
4	24-25	before d.o.	297	182	151	630		
5		after d.o.	295.515	178.36	147.225	621.1		
6								
7			162%	118%	99%			

$$\frac{295}{182} \cdot 100 \quad \frac{178}{151} \cdot 100 \quad \frac{147}{148} \cdot 100$$

	A	B	C	D	E	F	G	H	I
1	Department	10th	new 10th	11th	new 11th	12th	new 12th	Total	Percentage of dep classes
2	Art	31	50.24725	33	38.90066	35	34.76351	123.9114	$\frac{H2}{3763}$ 3%
3	Biology	198	320.9341	95	111.9868	26	25.82432	458.7451	$\frac{H3}{3763}$ 12%
4	Chem	59	95.63187	126	148.5298	109	108.2635	352.4252	$\frac{H4}{3763}$ 9%
5	English	183	296.6209	155	182.7152	152	150.973	630.3091	$\frac{H5}{3763}$ 17%
6	French	41		32		49			" " 0%
7	German	19		22		10			" " 0%
8	Spanish	51		26		33			" " 0%
9	LANG	111	179.9176	80	94.30464	92	91.37838	365.6006	" " 10%
10	Math	184	298.2418	201	236.9404	262	260.2297	795.4119	" " 21%
11	Music	50	81.04396	56	66.01325	49	48.66892	195.7261	" " 5%
12	Physics	50	81.04396	58	68.37086	183	181.7635	331.1783	" " 9%
13	Social Studies	183	296.6209	131	154.4238	59	58.60135	509.6461	" " 14%
14									
15								3762.954	100% <i>sum ✓</i>

$$f_x = (K2 - I2)$$

	A	B	C	D	E	F	G	H	I	J	K	L
1	Department	10th	new 10th	11th	new 11th	12th	new 12th	Total	Percentage of dep classes	Teachers we have	Percentage of dep teachers	Difference between % of dep teachers and % of dep classes
2	Art	31	50.24725	33	38.90066	35	34.76351	123.9114	3%	1	3%	0%
3	Biology	198	320.9341	95	111.9868	26	25.82432	458.7451	12%	4	13%	1%
4	Chem	59	95.63187	126	148.5298	109	108.2635	352.4252	9%	3	10%	0%
5	English	183	296.6209	155	182.7152	152	150.973	630.3091	17%	5	16%	-1%
6	French	41		32		49			0%			0%
7	German	19		22		10			0%			0%
8	Spanish	51		26		33			0%			0%
9	LANG	111	179.9176	80	94.30464	92	91.37838	365.6006	10%	3	10%	0%
10	Math	184	298.2418	201	236.9404	262	260.2297	795.4119	21%	6	19%	-2%
11	Music	50	81.04396	56	66.01325	49	48.66892	195.7261	5%	1	3%	-2%
12	Physics	50	81.04396	58	68.37086	183	181.7635	331.1783	9%	3	10%	1%
13	Social Studies	183	296.6209	131	154.4238	59	58.60135	509.6461	14%	5	16%	3%
14												
15								3762.954	100%	31	100%	

3% - 3%
13% - 12%
9.7% - 9.4%

05 Results

L	M	N
Difference between % of dep teachers and % of dep classes		
0%		
1%		
0%		
-1%	*	1
0%		
0%		
0%		
0%		
-2%	**	4
-2%	**	2
1%		
3%		

06 Conclusion

Difference between % of dep teachers and % of dep classes

Math: 4 teachers

0%

1%

0%

-1%

0%

Music: 2 teachers

0%

0%

0%

English: 1 teachers

-2%

-2%

1%

3%

Strengths + Weaknesses

Shift in class trends

- interest for classes in each department may fluctuate

Versatile

- isn't influenced by particular details such as class size, overscheduling, etc.

Lang department

- combine the different language classes into one department