

# Epsilon Presentation

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A dark blue diagonal gradient bar that starts from the bottom left corner and extends towards the top right corner, covering the bottom half of the slide.

# What faculty should we hire?

- Found the specific enrollments of all students in 2023-2024
- Found teacher-to-student ratios of the current year and applied them to the next year
- Took out the teacher(s) that had the least change in work

# Assumptions:

- 2 years of social studies (1 required during sophomore year)
- 3 years English required and only 1 english course per year
- 3 years Math (at least 1 per year)
- Each of three sciences by the time they graduate
  
- Teacher workload was average from 2022-2023
- The 2022 - 2023 class is at capacity (490 students out of 490 max)
- The proportion of students who enroll in each class stays consistent each year
- An equal proportion of each grade drop out each year

# How we calculated class size

- Number of english enrollments = total number of students

*Connection???*

**In 2022-2023 there are...**

- **183 sophomores**
- **155 juniors**
- **152 seniors**

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	42	49	132
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
total:	1049	945	967	2961
2022-2023				

# How we calculated the number of new sophomores for 2023-2024

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	42	49	132
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
total:	1049	945	967	2961
2022-2023				

“ Next year, the new sophomore class will have 140 more students than the graduating senior class.”

- 5% of all seniors before they graduate dropout throughout the 3 years (10th, 11th, and 12th)
- In 2022-2023, 152 seniors graduated, so in **2023-2024 there would be 292 sophomores**

# The total class sizes for 2023-2024

- **292 new sophomores, new max capacity of 630.**
- New seniors for 2023-2024 = junior class of 2022-2023
  - **155** new seniors before counting the dropout rate
- New juniors for 2023-2024 = sophomore class of 2022-2023
  - **183** new juniors before the drop outs are counted for.

12th	155
11th	183
10th	292



Multiply the before dropout number (on the left below) by the cube root of 0.95.

- Why? Because 5% drop out total before graduation, so each year the percent who drop out is the cube root.
- After rounding, we get the numbers below, and a total of 624 students.

	2023-2024
12th	152
11th	180
10th	292

Wait... $624 \neq 630$

The instructions said that the wing was added so that the student population *can* be increased to 630, not that it will be.

They wanted to do that in case nobody dropped out, but it shouldn't change our numbers *too* much anyways.

This is pretty much the only way the other numbers work out, assuming that the same percentage of students drop out every year.

# Project the number of students in each course for 2023-2024 (ex. sophomores)

- Sophomores in a class / total sophomores = % who take course (in 2022-2023)
- Multiply the total sophomores by the % who are enrolled per course (in 2023-2024)

# of sophomore enrollments per course next year!

Art	0.1693989071	49
Biology	1.081967213	316
Chemistry	0.3224043716	94
English	1	292
French	0.2240437158	65
German	0.1038251366	30
Spanish	0.2786885246	81
Mathematics	1.005464481	294
Music	0.2732240437	80
Physics	0.2732240437	80
Social Studies	1	292



# Project the number of student enrollments per course for 2023-2024 (cont.)

*We did the same for juniors and seniors...*

*This year...*

	Juniors	Seniors
Art	0.2129032258	0.2302631579
Biology	0.6129032258	0.1710526316
Chemistry	0.8129032258	0.7171052632
English	1	1
French	0.2709677419	0.3223684211
German	0.1419354839	0.06578947368
Spanish	0.1677419355	0.2171052632
Mathematics	1.296774194	1.723684211
Music	0.3612903226	0.3223684211
Physics	0.3741935484	1.203947368
Social Studies	0.8451612903	0.3881578947



*Next year...*

11th	12th
38	35
110	26
146	109
180	152
49	49
26	10
30	33
233	262
65	49
67	183
152	59


# Teacher-to-Student Ratios for 2022-2023

Department	10th	11th	12th	Total	Teacher Count	Teachers/Enrollment	old student teacher ratios (2022-2023)
Art	31	33	35	99	1	99	1.01%
Biology	198	95	26	319	4	80	1.25%
Chemistry	59	126	109	294	3	98	1.02%
English	183	155	152	490	5	98	1.02%
French	41	42	49	132			
German	19	22	10	51			
Spanish	51	26	33	110	3	98	1.02%
Mathematics	184	201	262	647	6	108	0.93%
Music	50	56	49	155	1	155	0.65%
Physics	50	58	183	291	3	97	1.03%
Social Studies	183	131	59	373	5	75	1.33%
total:	1049	945	967	2961	31		

# Rough Amount of Teachers for 2023-2024

Department	10th	11th	12th	total	
Art	49	38	35	123	1.240273
Biology	316	110	26	452	5.653213
Chemistry	94	146	109	349	3.565966
English	292	180	152	624	6.367347
French	65	49	49	163	
German	30	26	10	66	
Spanish	81	30	33	145	
Mathematics	294	233	262	789	7.305694
Music	80	65	49	194	1.250411
Physics	80	67	183	330	3.403467
Social Studies	292	152	59	503	6.708387
total:	1674	1097	967	3738	

\* Ratio



# Finding the difference: how many teachers do we need to hire to maintain the old ratios?

What we have currently

Old teacher count	target teacher count
1	1
4	6
3	4
5	6
3	4
6	7
1	1
3	3
5	7

What we need to maintain ratios (rounded from prev. slide)



difference
0
2
1
1
1
1
0
0
2
8

Subtract those two columns to get how many teachers we should hire!

But we can only hire 7...

# So... what should we do?

Well, we will simply take out the teacher who is needed the least!

- Look at decimals

1.240273	de	0.240273
5.653213		1.653213
3.565966		0.565966
6.367347	at t	1.367347
3.812560		0.812560
7.305694		1.305694
1.250411		0.250411
3.403467		0.403467
6.708387		1.708387

Chemistry  
:(

# Final Hire List

We've decided to hire...

2 Bio Teachers

1 English Teacher

1 French-Spanish Teacher (German is the least popular by far)

1 Math Teacher

2 Social Studies Teachers

# Pros and Cons of this Model

## Pros:

- Simple
- Intuitive
- Easy to implement
- Does not massively change class structure for 2023-2024

## Cons:

- Doesn't account for following years
- Some teachers didn't get help (i.e. Chemistry)
- Didn't look at specifics, such as scheduling, etc.