[redacted] Lab 0 David Curie PHYS 1601 L-01

How many kilograms of paper were used by the Vanderbilt student body in th

Plan:

To get my answer, I am going to consider the amount of commodore cash printing over this past year and use myself as the "example Vanderbilt student." After this I will multiply it by the number of students at Vanderbilt. I will also take into consideration the number of clubs at Vanderbilt and treat them each as two extra students, since many clubs print out several flyers and posters. I am estimating a club as "two people" worth of paper because some clubs like VSG print out a very large number of flyers while other clubs print significantly less paper on average. Afterwards, I will use the fact that an 8.5 inch by 11 inch piece of printer paper is approximately 4.5 grams to estimate how many kilograms of paper we consumed this year.

*I am also considering the amount of paper printed on campus after classes were made remote to be negligible. Additionally, I interpreted "consumed" to mean paper printed by students.

Data:

Approximate amount of commodore cash spent on printing: approx. ₪ 15.36 per student per school year*

Cost per page: ₪0.06 per page

Number of students (undergraduate and graduate): 13131 students → (source: https://www.vanderbilt.edu/about/facts/)

Number of registered student organizations at Vanderbilt: approx. 500 organizations →

Weight of one 8.5" X 11" sheet of printer paper: approx. 4.5g → (source: https://ansuz.sooke.bc.ca/entry/12)

* I found this by going on my GET profile and seeing how much I spent on printing at school this year.

Calculations:

1) Number of pages printed per student per year

$(15.36 \text{ dollars/person per year}) / (0.06 \text{ dollars/page}) = 256 \frac{\text{pages}}{\text{student per year}}$

2) Number of pages printed by student orgs per year

$(500 \text{ orgs})(2 \text{ students/org})(256 \frac{\text{pages}}{\text{student per year}}) = 256000 \text{ pages/year}$

(2 students/org: rough estimate of how many papers the average student org prints)

3) Number of pages printed by all students

$(13131 \text{ students})(256 \frac{\text{pages}}{\text{student per year}}) = 3361536 \text{ pages/year}$

4) Total number of pages printed per school year

$3361536 \text{ pages/year} + 256000 \text{ pages/year} = 3617536 \text{ pages/year}$

5) Total weight of paper used this year

$(3617536 \text{ pages/year})(4.5 \text{ g/page})(\frac{1 \text{ Kg}}{1000 \text{ g}}) = 16278.912 \text{ Kg/year}$

The weight of a piece of paper has 2 significant digits, so it is necessary to round accordingly.

Therefore, the Vanderbilt student body consumed 16000 Kg of paper this year.

Error:

In this lab I made several rough estimations (ie # of clubs) and assumptions (ie my printing habits being representative of the entire student body). Therefore, there was room for significant uncertainty in my data. This uncertainty was also likely to multiply in magnitude because the calculations are based off of initial estimations.

Description of scope / assumptions

Key values

Results

Comment on validity