

Grade Level vs Hours of Sleep



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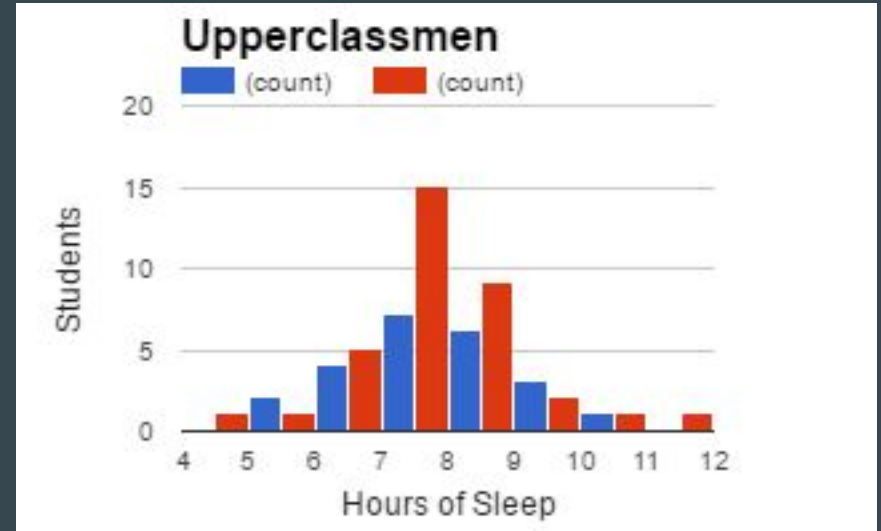
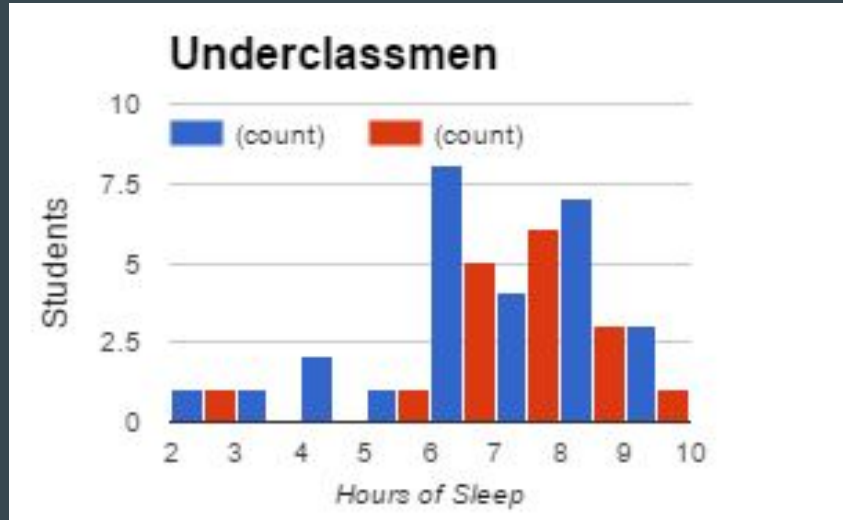
Research Question and Reason for Choosing it

We wanted to see if the number of hours a student sleeps each night has anything to do with their grade level (9th, 10th, 11th, or 12th grade). With IB/PSEO classes being taken by upperclassmen (11th and 12th), as well as planning for college, we were interested in finding out if that mean underclassmen (9th and 10th) sleep more than upperclassmen. Our research question is “Does a student’s grade level have any bearing on how long they sleep each night?”

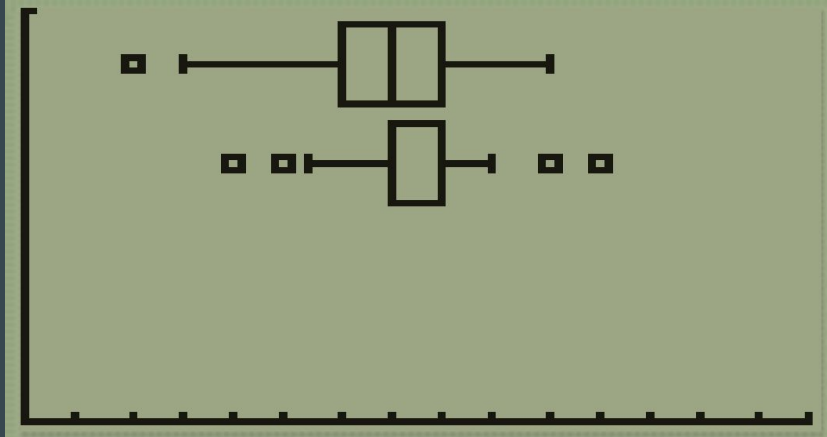
Raw Data

	Freshman	Sophomore	Juior	Senior
Time (hours)	2	6	9	9
	6.5	7	6	8
	6	7	7.5	8
	8	8	7	7
	4	2	7	7
	7	7	9	10
	8	6.5	8	7
	9	5	5.5	8
	7	6	5.5	7
	6	8	6	7
	9	9	7	7
	6	8	7	7
	7.5	7	8.5	8
	8	7	8	8
	5.5	6	6.5	6
	6	7	8	11
	6.5	6	9	8.5
	8		7	7
	4.5		10	6
	8		6	7
	3		8	7
	9		8	6.5
	7.5		7	6
	6.5			7
	10			7
	8			7.5
	6.5			5
	8			6
				8
				7
				4
				7
				9
				8
				8.3

Graphs/Analysis



Graphs/Analysis Continued



Project Overview

We collected data from 45 underclassmen by going into different underclassmen classrooms during the same class period--so as not to get any repeating data. We did the same thing during the same class period for upperclassmen, and collected data from 55 of them.

Hypotheses

μ_1 = The mean number of hours of sleep of all upperclassmen

μ_2 = The mean number of hours of sleep of all underclassmen

Before collecting data, we predicted that underclassmen sleep more than upperclassmen because of IB classes, community service hours, and figuring out plans for after high school.

Assumptions

- Random
 - SRS of a total of 100
 - 45 underclassmen and 55 upperclassmen
- Normal
 - Underclassmen: $45(30) \geq 10$ $45(1-30) \geq 10$
 - Upperclassmen: $55(30) \geq 10$ $55(1-30) \geq 10$
- Independent
 - There are at least 450 underclassmen, and at least 550 upperclassmen

Inference Procedure: Two Sample t-Interval

$$(7.36 + 6.74) \mp 2.021 \sqrt{(1.25^2/55) + (1.71^2/45)}$$

$$+ 14.41$$

$$- 13.48$$

Conclusion

We are 95% confident that the interval from 14.71 to 13.48 (1.23) will capture the difference (upperclassmen - underclassmen) between the mean of hours of sleep for upper classmen and the mean hours of sleep for underclassmen.

Final Summary

Limitations of the study:

- Teachers not wanting their classes surveyed
- Time to take samples
- Not distinguishing between honors/AP/IB classes, and regular ones.

As a whole, it seems that underclassmen sleep LESS than upperclassmen, but there is also a higher amount of variance between the amount of sleep each underclassman gets. This could be explained by a greater variance between how responsible each underclassman is, while upperclassmen are more mature, and may also have a greater appreciation for the sleep they do get.