I will be better at estimating the essay

I believe that year 10 pupils will be better at estimating the length of a stick than year 7 pupils are.

I think this because year 10 pupils have more experience, and also I fell I was better at estimating in year 10 than I was in year 7. PlanAll my data in my experiment was collected for me. A teacher went into every class in years 7 and 10 and held up a stick of 1. 36m horizontally.

The pupils then had to estimate how long they though that stick was. The only piece of information that the pupils were given was that a door is about 2 meters high. To see if the year 10's are better than the year 7's are at estimating length I will work out the mean, median, mode and standard deviation. I will then draw tables and graph for year 10 and year 7. I have to make sure that I take an equal sample of both year 7 and year 10; I will take a random sample of 20% of each year.

This will mean that I will have 72 data values in all. AimMy aim is to be able to gather enough information so that I can prove my hypothesis true or false. I will have to compare the averages of my results from year 7 and year 10. This will then give me a better idea of the difference between them both.

If this shows that year 10's estimates are closer than year 7's then I will have proven my hypothesis right. SamplingThere are 182 data values in year 7 and there are 180 in year 10. I have decided to take 20% of each of these this will give me a sample size of 36 from each year. I have chosen to gather my information by using stratified sampling.

I have chosen this process as I feel it is the easiest and most efficient method. I also want to take an equal percentage of boys and girls from my samples so that it is fair. Year 7 samplingThere are 182 pupils in year 7 I want a sample of 20%. 20 x 182 = 36100Boys74 x 36 = 15182I told my calculator that my data values went up to 182 the used the " Ran#" button on my calculator to randomly choose the 15 boys.

NumberLength121. 00281. 503121. 504141. 505211. 406331.

507391. 508431. 509441. 3010451. 0011481. 2512651.

2013691. 5014731. 5015741. 00Girls108 x 36 = 21182NumberLength1761. 402911. 503961.

5041031. 5051041. 0061051. 3071071. 2081141. 5091151.

50101161. 25111261. 50121311. 50131340. 50141351. 50151371.

50161391. 60171441. 50181531. 50191611. 50201661.

50211791. 60Year 10 SamplingThere are 180 pupils in year 10 and I want a sample of 20%20 x 180 = 36100Boys87 x 36 = 17180NumberLength113. 20271. 323131. 204201. 505234.

006271. 407351. 258371. 359401. 3010411.

7511431. 3412441. 5013501. 3014511. 0015641. 2516710.

9517851. 45Girls93 x 36 = 19180NumberLength1891. 502901. 153914. 804981.

5051011. 5061031. 8071091. 7081101. 7591111. 75101141.

50111151. 58121281. 70131331. 50141361. 38151421. 25161561.

52171601. 25181761. 20191781. 05Finding the mean, median and modeYear 7Estimation of LengthFrequencyMidpointFX0. 00 L 1.

2070. 64. 21. 20 L 1. 4061. 37.

81. 40 L 1. 60231. 534.

5Total Frequency = 36Total FX = 46. 5Mean46. 5 = 1. 29166666736mean = 1. 29 mModeThe modal class is : 1. 40 L 1.

60MedianThe median is found in the class interval 1. 40 L 1. 60Range1. 60 – 0. 50 = 1.

10Year 10Estimation of LengthFrequencyMidpointFX0. 00 L 1. 2060. 63. 61.

20 L 1. 40111. 314. 31. 40 L 1.

60101. 5151. 60 L 1. 8061.

710. 21. 80 L 2. 0001. 902.

00 L 2. 2002. 102. 20 L 2. 4002.

302. 60 L 2. 8002. 702. 80 L 3. 0002.

903. 00 L 3. 2003. 103. 20 L 3. 4013.

33. 33. 40 L 3. 6003. 503. 60 L 3.

8003. 704. 00 L 4. 2014. 14. 14.

20 L 4. 4004. 304. 40 L 4. 6004.

504. 60 L 4. 8014. 74.

7Total Frequency = 36Total FX = 55. 2Mean55. 2 = 1. 5336mean = 1. 53

mModeThe modal class is : 1. 20 L 1.

40MedianThe median is found in the class interval 1. 40 L 1. 60Range4. 80 – 0.

95 = 3. 85The mean will tell us the overall average of people's estimates. The median is to find the middle value, the mode will tell us the value that has appeared the most in the data, and the range will tell us the difference between the highest and the lowest data values. Standard deviation will tell us the variation in the whole data set.

Cumulative frequency tablesFrom drawing these tables I can now draw up cumulative frequency graphs to find out the lower quartile range, upper quartile range and the inter quartile range. Year 7Estimation of LengthCumulative Frequency0. 00 L 1. 2070. 00 L 1. 40130.

00 L 1. 6036Upper quartile range: 3 of 36 = 274U. Q. R. = 1. 53Lower quartile range: 1 of 36 = 94L.

Q. R. = 1. 28Inter quartile range: U.

Q. R – L. Q. R = I. Q.

RI. Q. R. = 1. 53 – 1.

28 = 0. 25Median27 – 9 = 18median = 1. 54Year 10Estimation of LengthCumulative Frequency0. 00 L 1.

2060. 00 L 1. 40170. 00 L 1.

60270. 00 L 1. 80330. 00 L 2.

00330. 00 L 2. 20330. 00 L 2.

40330. 00 L 2. 80330. 00 L 3.

00330. 00 L 3. 20330. 00 L 3. 40340. 00 L 3.

60340. 00 L 3. 80340. 00 L 4. 20350.

00 L 4. 40350. 00 L 4. 60350. 00 L 4. 8036Upper quartile range: 3 of 36 = 274U.

Q. R. = 1. 60Lower quartile range: 1 of 36 = 94L. Q.

R.= 1. 25Inter quartile range: U. Q. R – L. Q.

R = I. Q. R1. 60 – 1. 25 = 0. 35Median27 – 9 = 18median = 1.

41ConclusionFrom processing the data I see that the year 7 with a mean of 1. 29m are better at estimating length than the year 10's with a mean of 1. 53m are. Although the year 10's mean was only 0.

17m away from the actual length of the stick, this could indicate that if the data was processed again the year 10's might be better at estimating length. The year 10's had a higher standard deviation than the year 7's this indicates that some of the year 10's data values were either very high or

very low. The range confirms this, as there is a difference of 3. 85 between the highest and lowest values. This tells us that this group could have been completely changed by 1 person either estimating too high or too low.

From my tables I can see that most year 7's estimations were in the 1. 40 L 1. 60 group and most of the year 10's estimations were n the 1. 20 L 1. 40. This tells us that the year 10's estimated more values in the right group but the very high vales distorted the overall mean.

I conclude that the year 7's in this case were better at estimating length than the year 10's were. This however could change if the sampling were to be done again. EvaluationI think that I produced a valid and suitable investigation. I made sure that all my sampling was done fairly and randomly. I also took into consideration my aim throughout my experiment so that I could perform it suitably. I feel there are things that could have been done to improve my investigation.

I think that when gathering the information pupils could have been asked to do this separately as they might have copied what someone else had put. From the data values u can see that some people just put down the height that they were told a door was. This could have maybe could have been stopped If they were also told they weren't allowed to put down the height of a door as their answer. This is what I would do if the data was collected and processed all over again.