Statistics Project

Statistical Question: Valid statistical question that is clearly stated, focused, and interesting.

A healthy diet is essential in a happy, healthy lifestyle. This is why I chose my problem question for this statistics project, "Do sleep patterns from the night before affect eating habits the day after?" I know that eating a healthy diet and amount of food is important in feeling good and being productive. I believe that sleep is very important in order to have a good, productive day. Although getting to bed at a good time can be difficult because of homework, after-school activities, and personal/family time, it is extremely important to carve out time for sleep. Regardless, sleep *does* have a big impact on eating habits during the day, as I found in my research.

Data Collection: Evidence of direct data collection by students. Data were collected in

an appropriate manner (simple random sample) to answer the statistical question. Raw

data are included along with a clear description of the sampling method.

Speaking of my research, I should explain it a bit. I took a random, simple sample of 23 people from The Blake School 7th Grade. I took this sample by getting a list of every student in the Blake 7th Grade and assigning each of them a number. Then, I used a random number generator called "random.org" and generated 25 random numbers. I then created my survey and sent it out. I asked them 2 questions: a. How many hours of sleep did you get last night? b. How much did you eat for lunch today? When I sent out my online survey, two people did not respond so I ended up with 23 results. The results shall prove very interesting. Here is the raw data I collected:

Data Display: Includes appropriate, well-labeled, accurate displays (graphs and tables)

**of the data. One display is a boxplot and the other is the choice of the student.**

Hours of Sleep	Normal Amount of Food at Lunch/Not
7.5	Yes
7	Yes
7	No
8	Yes

|	
8	No
8	No
6	Yes
7	Yes
7	Yes
5	No
4	No
9	No
4	No
3.5	Yes
7.5	No
7	Yes
12	No
7.5	No
4	No
9	Yes
7	Yes
6	No
8	Yes

Data Analysis: Includes mean, median, mode, range, interquartile range, and mean

absolute deviation. Analysis of the data is accurate, thorough, and appropriate.

The first set of data analysis I took was for all the data, the entire total.The mean amount of sleep is 6.9. This means that on average, people in in the Blake 7th Grade get just about 7 hours of sleep a night. The lowest amount of sleep recorded, or the minimum, is 3.5 hours. The highest amount of sleep recorded, or the maximum, is 12 hours. This means that there is a pretty big range of data. Speaking of the range, it is 8.5. That's a pretty big difference when it comes to something like hours. The first quarter is 6, the second quarter is 7, and the third is 8. This means that 75% of

the data is between 6-8 hours of sleep. This is the most common amount of sleep in the Blake 7th Grade according to my calculations. The interquartile Range is 2, which means that the data is not very spread out at all. Sure, there are a few oddballs, but for the most part the data is very close together. Here is the boxplot:


Total Data
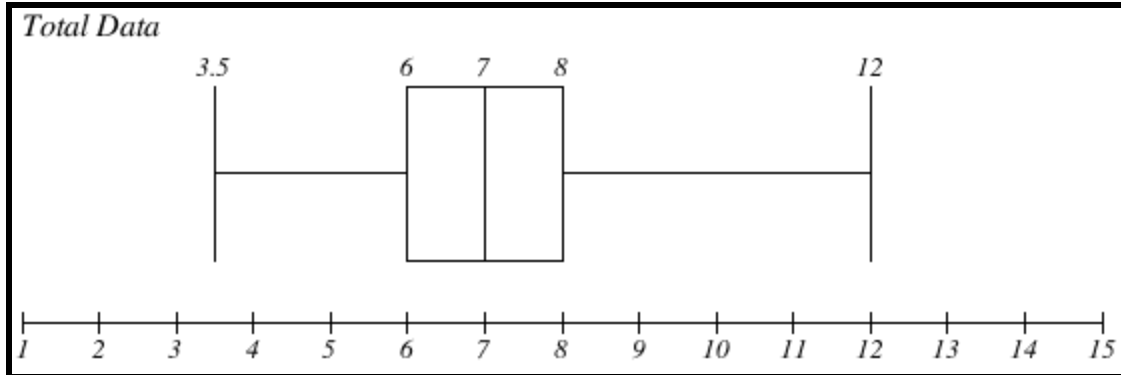
The next set of data I took was for those who said they do NOT eat a normal amount of food at lunch. The median, or middle, of this data was 7. The mean came out to be 6.6, which means that the average person from my grade who doesn't eat a normal amount of food at lunch gets about 6 ½ hours of sleep at night. The minimum amount of sleep was 4, which means that the lowest amount of sleep (from a person who doesn't eat a normal amount of food at lunch) is 4 hours. The maximum is 12, which means that the highest amount of sleep (from a person who doesn't eat a normal amount of food at lunch) is 12 hours. The first quarter is 4, which means that about 25% of people (from my grade) who don't eat a normal amount of food at lunch get 4 hours of sleep during the night. Quarter two is 7, which is also the median. This means that about 25% of people (from my grade) who don't eat a normal amount of food at lunch get 7 hours of sleep during the night. Finally, the third quarter was 8. This means that, again, 25% of people (from my grade) who don't eat a normal amount of food at lunch get 8 hours of sleep at night. Here is the boxplot to represent the data of those who do NOT eat a normal amount of food at lunch:

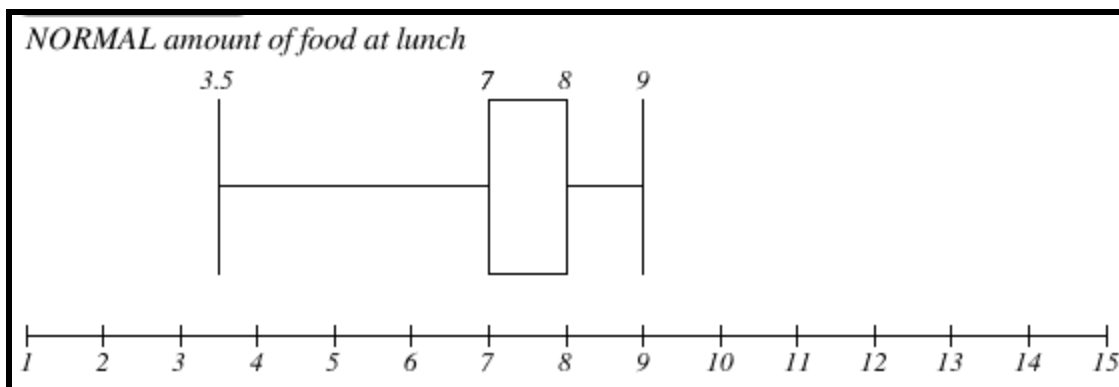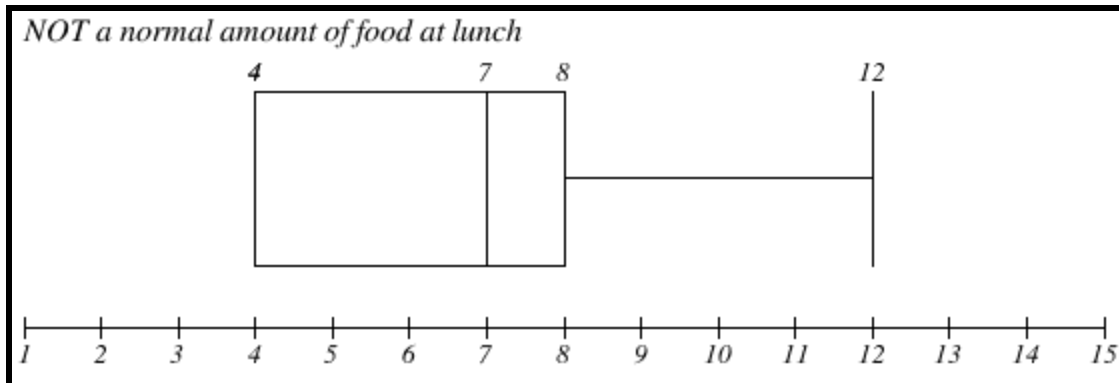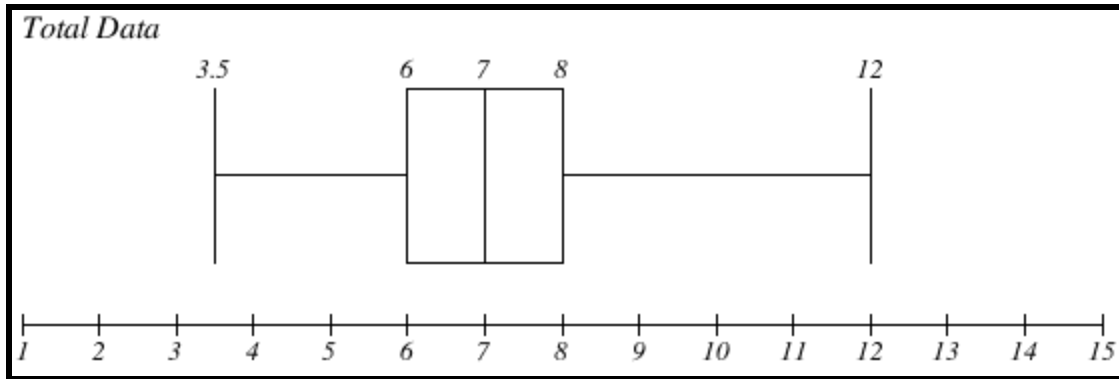*NOT a normal amount of food at lunch*
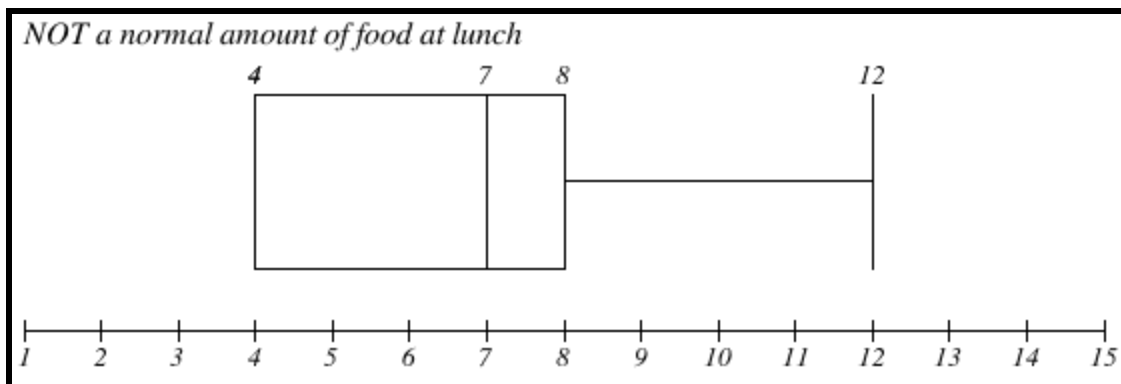
And the final set of data I analyzed is the data of those who DO eat a normal amount of food at lunch every day. The minimum is a shocking 3.5 hours. This ended up being a huge oddball out of the rest of the data, though, so it does not necessarily represent the rest of the data very well. The maximum was 9, so that means that the biggest amount of sleep was 9 hours for those who eat a normal amount of food at lunch during the day. The median is 7, which also represents quarter two. Quarter one was 7, and so was quarter two. This means that 75% of people who eat a normal amount of food at lunch get 7 hours of sleep at night. Quarter 3 ended up as 8 hours, so that means that 25% of people who eat a normal amount of food at lunch get 8 hours of sleep at night. The interquartile range is 1, so this means that the data is very consistent. The absolute deviation is about 0.8, which means that the data is at average less than one number apart. This means that this data is very close together and again, consistent. Finally, the range is 5.5. This also displays the fact that this set of data is more close together and consistent.
Here is the boxplot:

NORMAL amount of food at lunch
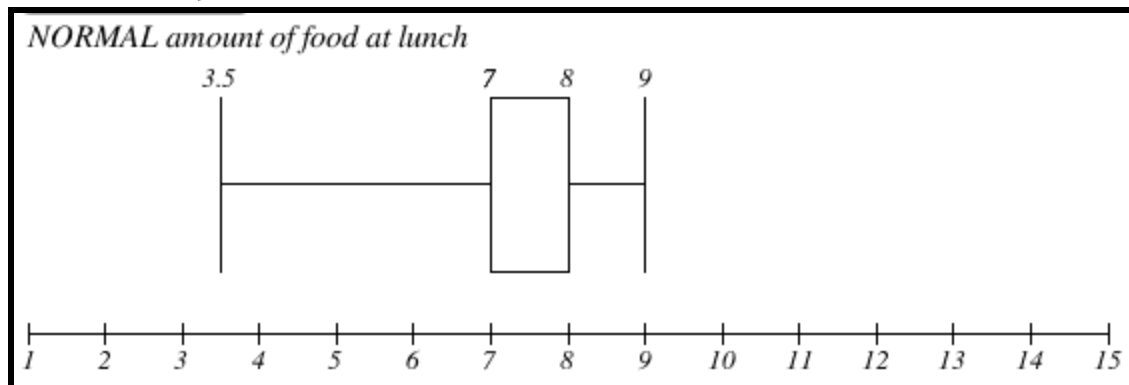
COMPARE:

Here are the three box plots next to each other for comparison:

Total Data

| 3.5 | | 6 | 7 | 8 | | 12 |

Box plot axis: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

NOT a normal amount of food at lunch

| 4 | | 7 | 8 | | 12 |

Box plot axis: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

NORMAL amount of food at lunch

| 3.5 | | 7 | 8 | 9 |

Box plot axis: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

As you can see, the data clearly shows that those who do not get enough sleep at night do NOT tend to eat a normal amount of food at lunch the next day. Almost everybody who did not eat a normal amount of food at lunch got below 8 hours of sleep at night. Studies have shown that 12-15 year olds need at LEAST 9 ½ hours of sleep at night in order to be productive the next day. Although most got below 8 hours of sleep in this category, some still got all the way up to 12 hours of sleep. This shows that those who don't eat a normal amount of food at lunch have an

unpredictable sleep schedule. Those who have a predictable, steady sleep schedule eat a normal amount of food at lunch.

Here is the stem and leaf plot:

Stem	Leaf
0	3 4 4 4 5 6 6 7 7 7 7 7 7 7 7 7 8 8 8 8 9 9
1	2

Conclusion: Conclusion includes a clear answer to the statistical question that is

consistent with the data analysis and method of data collection.

This study has shown that those who have an unpredictable sleep schedule do NOT eat a normal amount of food at lunch. Whereas those who do, those who have a steady, predictable sleep schedule, they eat a normal amount of food at lunch. What we have learned from this study is that not only does the amount of sleep a person gets at night affect the diet, but also the consistency of the sleep schedule. As I said in my introduction, both a healthy diet and a healthy sleep schedule are essential in a productive, successful lifestyle. This study has proven that if you do not have a consistent sleep schedule, it will affect your diet in a negative manner. Without these two essential elements in your schedule, if will make it hard to be productive and successful during the day.

Reflection on Process: Gives a good overall picture of the project, including what went

well and what didn't-and includes ideas for further study.

This study has proven quite successful, and although it didn't give me the results that I necessarily expected, it still answered the problem question very clearly. I expected the results to state that those who don't eat a normal amount of food during the day to get much less sleep in comparison to those who do. In reality, the result was that some of the numbers were actually consistent throughout both categories, but they were just less consistent. I thought the numbers would just be smaller for those who didn't eat a normal amount of food at lunch, but they actually weren't. They were just spread out. This is why the interquartile range and mean absolute deviation were much bigger for those who didn't eat a normal amount of food at lunch.