

Name _____

Investigation 17: How Many Hours of Volunteer Time?

Worksheet 17.1 Volunteer Work

Scenario

Does your high school have a requirement of students to perform community service hours? If there is a requirement, how many hours are required to fulfill the responsibility? Do you already volunteer your time? What type of volunteer work do you do? How many hours do you volunteer? What are the benefits of volunteering?

There are many volunteer opportunities available for high school students to take part in. Some places one might volunteer include: hospital, nursing home, animal shelter, food bank, library, tutoring center, museum, beach or park, or church. The excerpt below discusses some of the benefits for high school students to volunteer.

Volunteering has many benefits. Through volunteering, you'll get to explore a passion you have (such as literature or medicine). Also, by volunteering, you can support a cause you love such as helping the homeless. You can also meet like-minded students, who share your passion or want to support that cause.

Volunteering is a great opportunity to test out whether you'd like to pursue a specific career (such as medicine, education, etc.). It's great to try and find your passion in high school, so you don't waste time and money during college trying to figure out what you want to major in. If you don't enjoy volunteering at a hospital, maybe pre-med isn't for you. If you love volunteering at an animal shelter, maybe you should pursue a career as a veterinarian.

Volunteering is also a great extracurricular for your college application. It shows you selflessly dedicated your time and effort to helping others! Additionally, volunteering is a free experience that won't cost you anything other than time.

Source: <https://blog.prepscholar.com/volunteer-opportunities-for-teens>

Formulate a Statistical Question

A local school board is considering adding a community service graduation requirement for all district high school students. To help the school board make an informed decision, a small group of statistics students decided to select a random sample of district high school students who are already volunteering to determine the type of volunteer service and how many hours the students are volunteering. They decided to investigate the statistical question: "For district high school students who volunteer, what is an interval estimate for the mean number of hours they volunteer per year?"

Collect Appropriate Data

The 50 values below represent the number of hours per year that 50 randomly selected district high school students reported that they volunteer. The 50 students were randomly selected from a large group of district students who reported that they volunteered during the past year.

10	13	13	7	10	46	23	21	30	41	18	23
17	27	44	31	83	81	59	111	12	12	23	118
182	124	101	262	349	89	68	50	63	350	249	271
311	10	27	45	19	36	311	486	503	33	42	20
29	31										

1. Construct a dot plot of the 50 times.
2. Find the mean of the distribution of times and describe the distribution.
3. What would happen if another random sample of 50 district students were taken?
4. What patterns would emerge if a large number of random samples of 50 students were taken and sample means were used to build a sampling distribution?
5. Take a random sample of 50 slips of times with replacement and find the mean of the sample. Record the mean on the class dot plot.

Analyze the Data

6. Using the class distribution of sample bootstrap means, find the mean of the distribution.
7. Use the statistical software and generate 1000 bootstrap sample means. Remember to take a random sample of 50 with replacement.

8. Using the sample distribution of the 1000 bootstrap sample means, between which two sample means is approximately the middle 95% of the distribution?

The two sample means form an interval where 95% of the bootstrap sample means are located. This interval gives an interval where the population mean is likely to fall.

Interpret the Results in the context of the original question

9. Using the results from the bootstrapping resample method, answer the original statistical question, "For district high school students who volunteer, what is an interval estimate for the mean number of hours they volunteer per year?"
10. Share your interval with other groups in class. Compare the intervals. What are the similarities and differences.
11. Write a brief summary about the bootstrap method and how it works.
12. Explain how the bootstrap method could be used to construct an interval estimate for the middle 90% of the distribution.