Long showers

Annotation

Joseph poses a question that utilises statistical data to make a comparison. He plans how to measure the variable of interest (length of time taken to have a shower). The data he collects is multivariate measurement data (the two variables are time and person).

Joseph chooses two appropriate displays (a back-to-back stem-and-leaf graph and a histogram) to analyse and communicate his findings. His analysis involves him carefully considering the shape of the graphs (distribution of data) and closely comparing the two groups of interest (brother's shower times and sister's shower times).

Joseph communicates his findings in context, clearly relating his findings to his original question and noting interesting features of the data.

Problem: Long showers

The students in Room 10 are exploring questioning techniques across the curriculum. The teacher presents the following mathematics challenge:

Pose a question that can be answered by conducting a statistical investigation. Carry out the investigation and present your findings.

Student Response

Joseph's work sample is as follows:

Does my brother or my sister take longer showers?

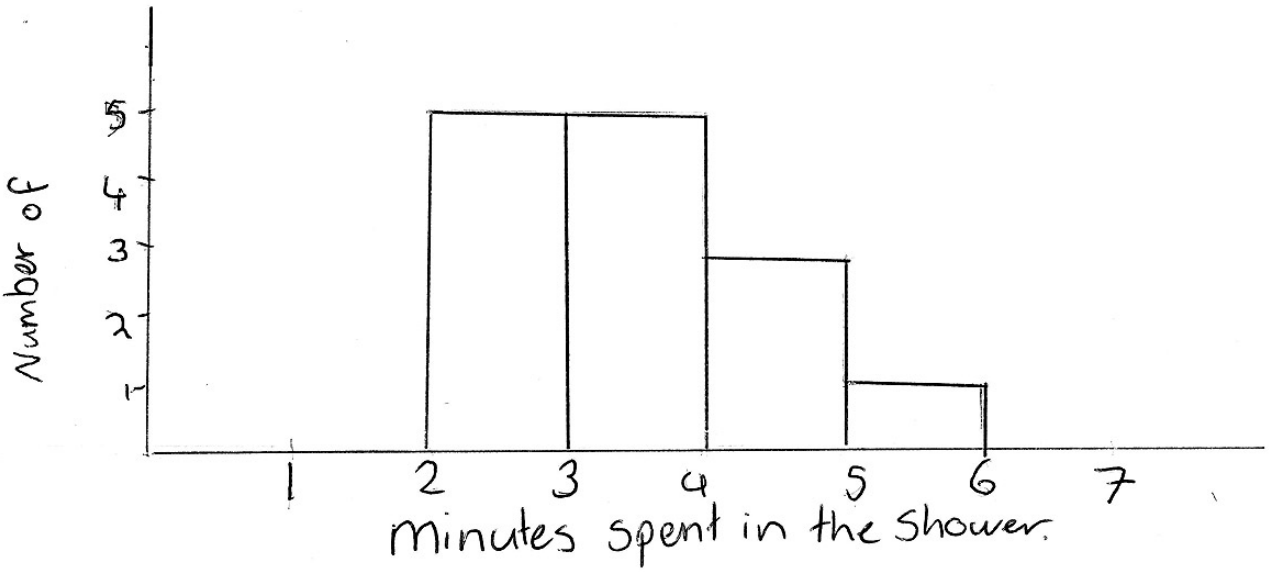
Plan: Use a stopwatch to record the length of time in the shower for my brother and my sister every day for two weeks.

Day	Brother	Sister
Monday	3:42	6:03
Tuesday	4:22	2:45
Wednesday	2:59	6:12
Thursday	2:43	2:39
Friday	5:02	5:45
Saturday	2:33	2:48
Sunday	3:52	5:55
Monday	2:19	1:58
Tuesday	2:48	5:34
Wednesday	3:45	3:01
Thursday	3:22	6:00
Friday	4:05	2:44
Saturday	3:24	5:50
Sunday	4:10	2:50
Total	49:06	60:04

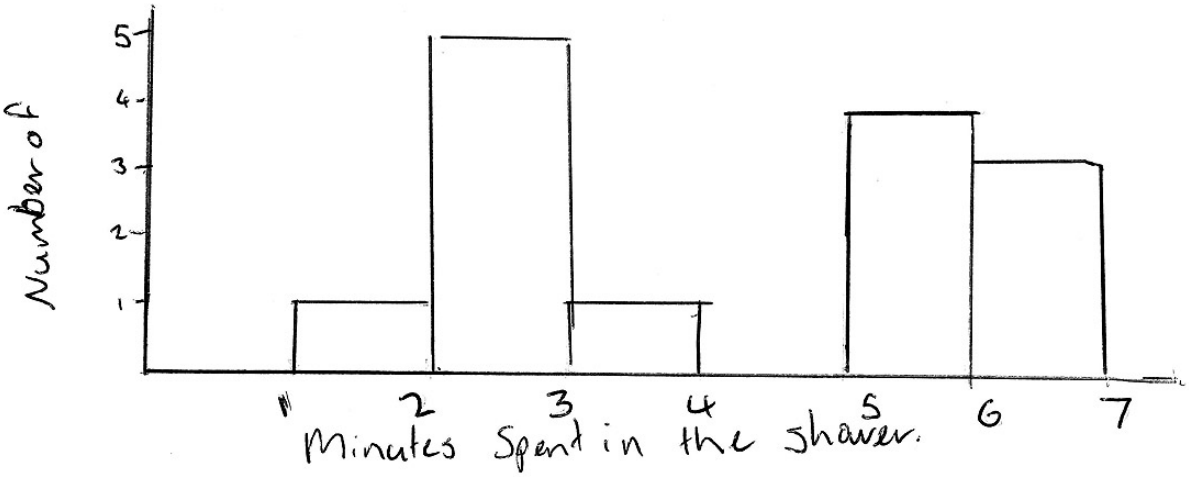
Time spent in shower

Brother seconds	min	Sister seconds
	6	00 03 12
02	5	34 45 50 55
22 10 05	4	
52 45 42 24 22	3	01
59 48 43 33 19	2	39 44 45 48 50
	1	58

Time in the shower for my brother.



Time in the shower for my sister.



Analysis and Conclusion

From the data displays we can see that my brothers showers are usually 2 to 5 minutes duration whereas my sisters shower seem to be either 2 to 3 minutes or 5 to 6 Duration. Interestingly, my sisters showers seem to follow a long, short, long, short pattern. In answer to my Question, my sister has both longer and shorter showers than my brother, but altogether my brother spends less time in the shower than my sister.

Teacher: Can you tell me what you did?

Joseph: My brother and sister are always arguing about who is hogging the bathroom, so I decided to secretly investigate who is really taking the longest showers. I thought that maybe my sister took longer showers so I posed my question to reflect this. Then I stood outside the bathroom and started my stopwatch when I heard the shower turn on and then stopped it when I could hear the water stop. When I had all my data, I made a stem-and-leaf graph and a histogram.

Teacher: Why did you do it that way?

Joseph: The histogram shows the shape of the data really clearly – and you can see my sister has either long or short showers. The stem-and-leaf graph shows exactly how long each shower was and also compares the data for my brother and sister.