

Presenting Data 1: Histograms and Box and Whisker Plots

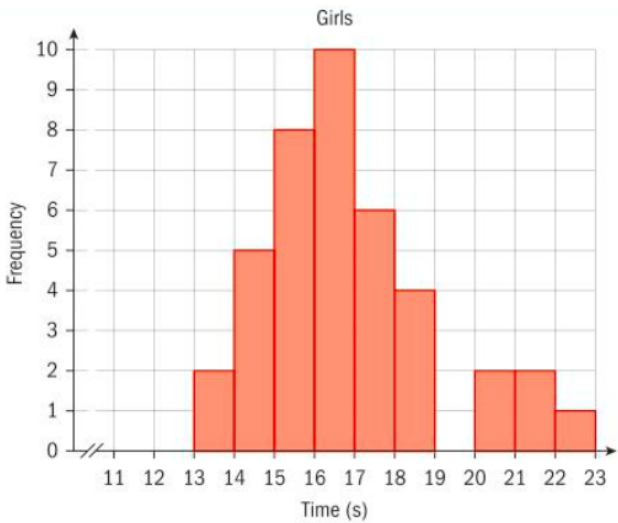
Belinda collected data on the time in seconds that the girls and boys in her year group took to complete a 100 m run.
The results are:

- Girls' times: 13.5, 13.8, 14.1, 14.3, 14.6, 14.7, 14.9, 15.2, 15.2, 15.3, 15.5, 15.5, 15.6, 15.7, 15.9, 16.1, 16.1, 16.3, 16.3, 16.3, 16.4, 16.6, 16.7, 16.7, 16.9, 17.2, 17.2, 17.5, 17.6, 17.8, 17.8, 18.4, 18.5, 18.9, 19, 20.1, 20.7, 21.4, 21.8, 22.5
- Boys' times: 11.5, 11.8, 12.1, 12.4, 12.4, 12.6, 13.1, 13.2, 13.2, 13.2, 13.5, 13.6, 13.7, 14, 14.1, 14.1, 14.2, 14.3, 14.3, 14.3, 14.5, 14.6, 14.7, 14.9, 15.3, 15.4, 15.5, 15.5, 15.5, 15.7, 15.8, 16.3, 16.4, 16.6, 16.6, 16.7, 17.1, 17.4, 17.7, 20.5

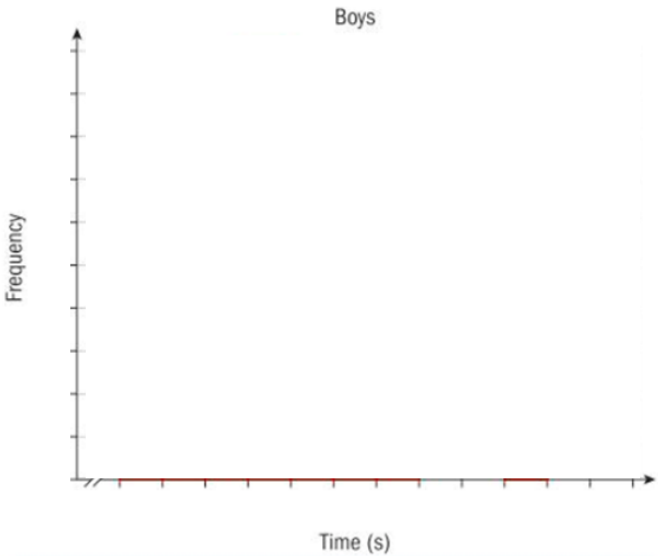
Time (t seconds)	Frequency (girls)	Frequency (boys)
$11 < t \leq 12$		
$12 < t \leq 13$		
$13 < t \leq 14$		
$14 < t \leq 15$		
$15 < t \leq 16$		
$16 < t \leq 17$		
$17 < t \leq 18$		
$18 < t \leq 19$		
$19 < t \leq 20$		
$20 < t \leq 21$		
$21 < t \leq 22$		
$22 < t \leq 23$		

1. Complete the frequency table given the data above. ☐

The frequency histogram for girls is given.



2. Complete the frequency histogram for boys.

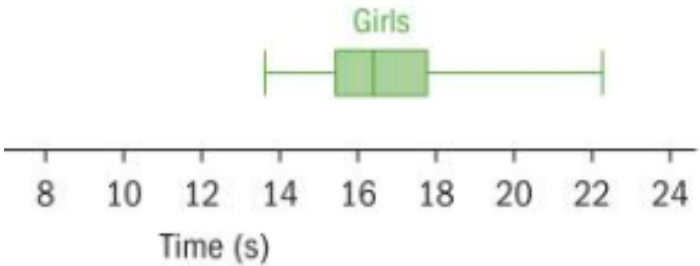


3. The PE teacher was interested in comparing the times of the boys and the girls for the 100 m run. For both the girls and the boys, find the following information:

	Fastest time	Lower quartile	Median	Upper quartile	Slowest time
Girls					
Boys					

Using the data from the table above, a box and whisker plot has been created for the girls.

4. Add a box and whisker plot for the boys.



Important!

- To draw a box-and-whisker plot you need five pieces of information, called the : the smallest value, the lower quartile (LQ), the median, the upper quartile (UQ) and the largest value.
- An is a value that is much smaller or much larger than the other values. An outlier is a point less than the or greater than the .

Data on the shoe sizes of a group of students is shown in the table.

Shoe size	34	36	37	38	39	40	41	42	49
Females	2	2	10	8	7	3	0	0	0
Males	0	0	3	7	12	9	3	1	1

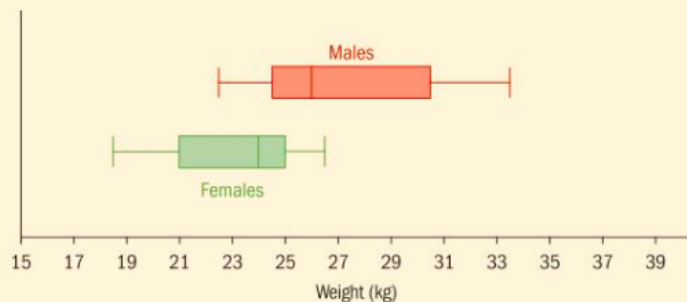
Draw a box-and-whisker plot for the females and for the males and compare the two plots.
State whether the box plots are symmetrical.
Comment on whether there are any outliers.
Draw the box plots again showing any outliers clearly. Outliers are represented by crosses.
Calculate to find any outliers.



Important!

- Interpreting a box-and-whisker plot:
- of values are between the value and the .
 - of values are between the and the .
 - of values are between the and the .
 - of values are between the and the .

The box-and-whisker plots show the weights, in kilograms, of 24 male poodles (upper) and 24 female poodles (lower).



- 1 Write down the median for both groups.
- 2 Write down the IQR for both groups.
- 3 Write down the percentage of female poodles that weigh less than 24 kg.
- 4 Write down the percentage of male poodles that weigh between 26 and 30.5 kg.
- 5 Compare the two box plots and discuss the differences.
- 6 **Factual** Which measures of central tendency and dispersion can you read from a box-and-whisker plot and from a histogram?