SHOE SIZES WITH BOX PLOTS

Student Notes

This TI-Nspire activity will help you to:
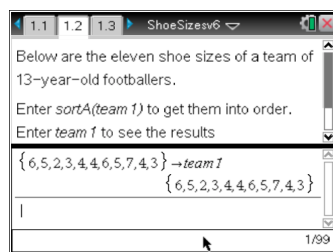- understand what a box plot is;
- use box plots to compare very large sets of data.

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1. Football team

On your TI-Nspire handheld open the document **ShoeSizes.tns**.

On page 1.2 there is a list of numbers that are the shoe sizes of the players in a football team.

Sort the numbers and then answer these five questions.

(a) Which is the largest shoe size?

(b) Which is the smallest?

(c) Which is the middle number?

(d) Which is a quarter of the way through the list?

(e) Which is three quarters of the way through the list?

Go to page 1.3 and produce a dot plot.
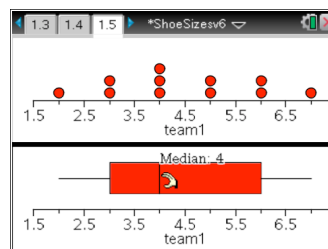
Does this make it easier to answer the five questions?

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2. Box and Dot Plots

Go to page 1.5 and see a dot plot and a box plot together.

Move the cursor over the box plot to see the answers to the five questions.

The Median is the middle number.

Q1 and Q3 (the lower and upper quartiles) are the numbers a quarter and three quarters of the way through the list.

Click (press) on one of the dots in the dot plot and you can see an equivalent shaded dot appear in the box plot.

Click on a blank part of the screen to clear the shading.

Try clicking on other shoe sizes and make sure you understand the connection between the dot plot and the box plot.

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3. Bigger feet

Go to page 2.1 to see the data arranged in a spreadsheet. Notice the name of the list, **team1,** at the top of the column.

On page 2.2, notice that a changed list, **team2**, has been entered.

Go to page 2.3 where you can compare the boxplots of **team1** and **team2**.

On page 2.4 you can make another team change.

After the change what do you think the five values will be?

How do you think the changes to the five values will alter the box plot?

Sketch it first and then go to page 2.5 to see if you were right on

Try some more changes to the data in the spreadsheet and see if you can predict the changes in the box plots.

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4. 1000 teenagers

On page 3.2 there are two very large data sets: the shoe sizes of 508 girls and 487 boys all aged 12.

On page 3.3 you can see the ranges of the two sets. Change from dot plots to box plots by pressing menu 1 2.

You will find that this time the box plots include "outliers" representing values that are very different from most of the others.

Look back to the dot plots to see these extreme values.

Write down a comparison of the girls' and the boys' shoe sizes. As well as the average shoe size, write about how spread out the data are.

5. 200 adults

The spreadsheet on page 3.5 has two data sets: the shoe sizes of 100 men and 100 women that are representative of the entire UK population.

Use the graphs on page 3.6 to display and compare the women's and men's shoe sizes.

Now compare boys' sizes with men's and also girls' with women's.

What do you notice?

Write a report describing the differences and similarities between these four large data sets.

6. Collecting your own data

Collect shoe-size data from a small set of teenagers or adults.

Enter them on a spreadsheet page and then plot them.

How does your small set of data compare with the much larger sets listed on pages 3.2 and 3.6?