Plotting For Success

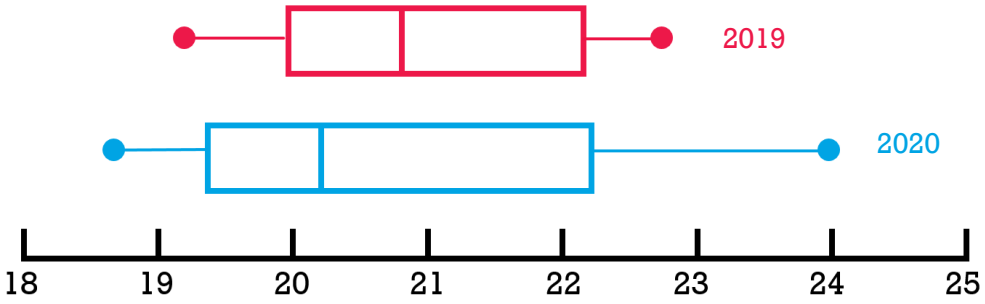
Name:

Introduction

Individual athletes respond to training programs differently. What may be a successful strategy for one athlete, may be detrimental to another. It is important for coaches to routinely evaluate the effectiveness of a training program for a given athlete. While this can be done from a single timed event, it is more accurate to compare a large pool of results and analyse changes over time.

An athlete timed their 5 km time trials over several months in both 2019 and 2020. The data is represented in the parallel boxplots below.

Your challenge is to compare the parallel boxplots and draw some conclusions about the 2019 training runs compared to the 2020 training runs.



Analysing Data

1. **Complete the table below using the box plot to estimate the five point summary statistics and range for each runner. Write your answers in minutes and seconds. For example, 10 minutes and 30 seconds would be written as 10: 30.**

Statistic	2019 (minutes: seconds)	2020 (minutes: seconds)
Minimum Value (Min X)		
Lower Quartile (Q1)		
Median (Q2)		
Upper Quartile (Q3)		
Maximum Value (Max X)		
Range (Max X – Min X)		

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2. **Use the boxplots to answer the questions below. Justify your answers by referring to the boxplot and summary statistics.**
   a. **In which year did the athlete record their best time trial?**

   b. **Which year shows the most consistent time trial performance?**

   c. **The athlete sustained an injury during one of the years of data collection. Which year was it?**

3. **Describe the shape of the distribution of each data set.**

4. **Explain why the median, not the mean would be the best measure of centre for the 2020 data set.**

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Challenge

1. **Make a possible data set of running times that could produce the boxplot for 2019. The data set must have a minimum of 18 running times.**

    - This might take some trial and error.
    - You may need to use a guess and check strategy to get started, or maybe you can think of a more systematic way to find a solution.
    - Make sure you can prove your solution works.

    Once you have a solution write it in the space provided.
    Additionally, share your problem solving process by annotating your working out.

    Solution:

    Problem solving process: