Purpose:

“Do students from Year 11 tend to throw a gumboot further than students in Year 9, for all of the students at [redacted] high school 2025?”

I think that Year 9 students will throw a gumboot further than the Year 11 students because it has been proven that as girls stop doing as much sports and athletic activities as they get older. So I think Year 11 students will tend to throw the gumboot a shorter distance than the Year 9 students.

Plan:

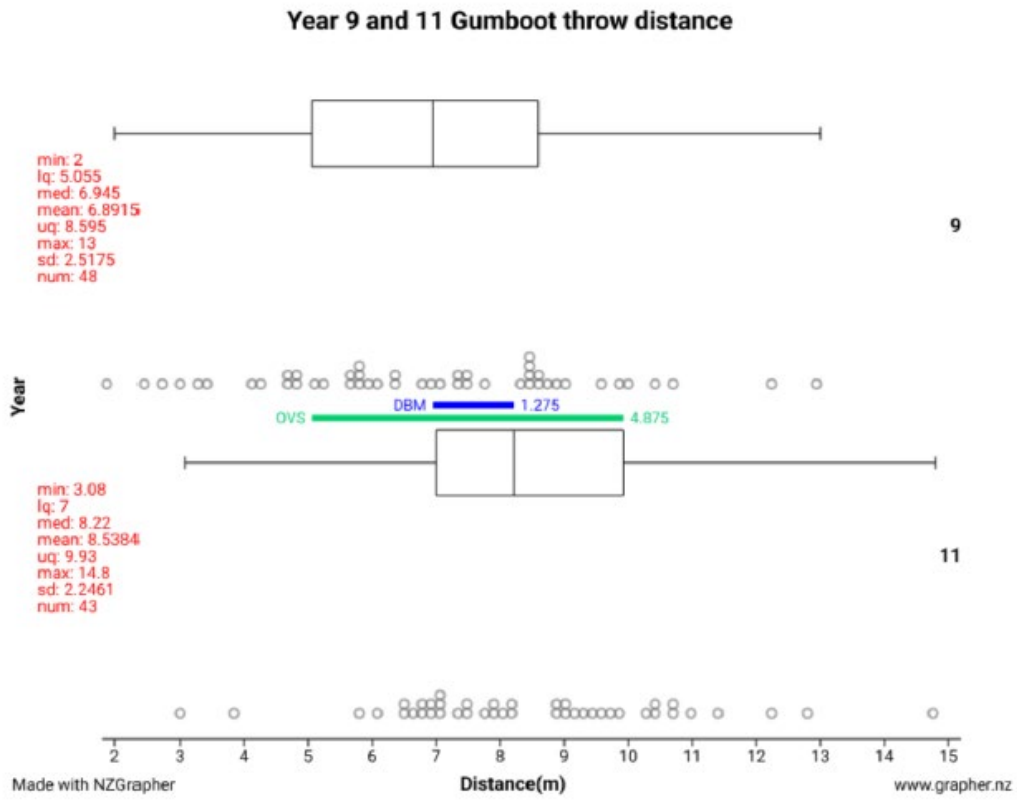
This was a random sample taken from the entirety of Year 9 and 11 students. The random sample of people were pulled out of class on period 5 on Friday and period 3 on Tuesday. It was a group of students who were given instructions and a demonstration from [redacted]. There were four station that were set up for throwing, each station had a wooden starting line with a measuring tape ready to go behind the wood. The measuring tape was moved on an angle if needed to get the correct measurement. Each student participating was allowed to have a run and spin if they wanted to, each student was instructed to stay behind the wooden starting line.

There was at least three students at each station at all times. One student making sure the participant was staying behind the throwing line, another student was required to move the measuring tape and read out the distance and the third was there standing next to the person measuring so they would then record the measurement down on paper.

Since there were four different stations all being run by students there could be an uncertainty in the measurements if someone was pulling the measuring tape tighter and someone at a different station was giving it more slack. They could have read it wrong due to bad eyesight or there could have been miscommunication when the person measuring was telling the person writing it down. Some people could have been wearing blazers therefore affecting their throw could also affect the accuracy of the data which could possibly make it harder to make the call.

Data:

I have taken a sample from the year 9 and 11 students at [redacted] for my investigation. Each dot on the graph represents one students gumboot throw distance.



Analysis:

In my sample the middle 50% of gumboot throw distances for year 9 students is a decent amount lower on the scale than the middle 50% of gumboot throw distances for year 11 students. The LQ (7m), median (8.22m) and UQ (9.93m) are all higher for the gumboot throw distance for year 11 students than the gumboot throw distance for year 9 students, with a LQ of 5.055 m, median of 6.945 m and UQ of 8.595 m. Although there is a difference in these values for each group, I can see that the middle 50% boxes for the gumboot throw distance of the year 9 students and year 11 students still overlap significantly. This makes sense because the year 11 students will have more experience as a whole compared to the year 9 students. Although if I was to take another sample this could be different because it could be a group of very athletic year 9 students and a group of year 11 students were many of them have dropped out of their sports and other athletic activities. The reason I think that is because it has be proven that when girls get older they often stop doing their sports.

I can see that the middle 50% box of gumboot throw distances of year 9 students is more spread out than the gumboot throw distances for the year 11 students. The IQR for the year 11 students gumboot throw distances is about 2.93 m and the IQR of the year 9 students gumboot throw distances is about 3.54 m. This is about

0.61m times as much variation in the year 9 students gumboot throw distances than in the year 11 gumboot throw distances. It could be that the some of the year 9 students are going through puberty and growth spurts while some of them are not, meaning some year 9 students will have longer arms for example. Unlike the year 11 students who are more likely to be finished growing so their distances don’t fluctuate as much.

In my sample I can see that the gumboot throw distance for both the year 9 students and year 11 students don't have a particularly obvious skew in either of them. This could be due to the same sample size in the graph. Although the gumboot throw distance for the year 9 students could been seen as slightly skewed to the left. There is a main cluster in the year 9

students gumboot throwing distance, the cluster is around the 9 m mark ranging from near 8.2 m to 9.5 m. The year 9 students have another smaller cluster of gumboot throw distances around 5.7 m to 6.3 m. Just like the year 9 students, the year 11 students also have 2 main clusters. The first main cluster of gumboot throw distances for year 11 students is around 8.9 m to 10 m, the second cluster for the year 11 students is around 6.5 m to 7.2 m. In the year 11 students gumboot throw distances, there is no clear peak unlike the year 9 students gumboot throw distances, there is a slight peak due to the main cluster. There is a semi large gap in the middle of the graph for the year 11 students gumboot throw distances, the gap goes from around 8.2 m to 8.8 m. That could be because in the sample taken there was some shorter students restricted to shorter gumboot throw distances and some taller students allowing them to throw a greater distance. If I had taken another sample that would definitely affect the gaps, maybe some of the taller students had their blazers on so that could effect their gumboot throw distance and potentially close the gap.

Conclusion:

I can conclude that I cannot make the call. I came to this conclusion by calculating the DBM (1.275m) over the OVS (4.875m). 1.275 divided by 4.875 is 0.26. I cannot make the call that year 11 students tend to have a further gumboot throw distance than the year 9 gumboot throw distances for all of the year 9 and year 11 students at [redacted] High school in 2025 because the DBM/OVS is less than 0.33 for group sizes of less than 100. This doesn’t makes sense because the year 11 students are more grown, making them taller, have longer arms and more sporting experiences. Although there is still some uncertainty because since the data was taken from 4 different stations they could all be slightly different and if it was a different group od year 9 students and year 11 students the data could have been different. I don't think we can be 100 percent sure about this outcome because is was only a small sample of students that was taken, only 92 students participated in throwing the gumboot so the data could be collected. I can conclude that I cannot say that Year 11 tend to throw a gumboot further than students in Year 9, for all of the students at [redacted] high school 2025.