Purpose:

A random sample of students were taken from the whole roll of year 9 and 11 school students to see if the students in year 11 tend to throw a gumboot further than the students in year 8 , for all the students at ▮ high school in 2025.

Question:

Do the students in year 11 tend to throw a gumboot further than students in year 9, for all the ▮ High School students in 2025?

I think that the year 11 will throw a further distance than the year 9 because they might have more strength,have a lighter boot, had no blazers or jerseys on and could have more muscle.

Plan:

The two groups where year 9s and year 11s, the data was collected by some of the year 11 math students, the variable being measured is how far gumboots can be thrown. The data was collected at ▮ high school the data was sourced by the sample that was taken from each year9 and year11 class, the data was collected during period 5 on a Friday and period 3 on a Tuesday at ▮ in 2025.the method in which the data was collected is one student would stand at the throw line and check if they did step over the line, one student would move the measuring tape and read the distance, and one student would stand next to the measuring person and record the distance on paper. The data collection process included many specific steps because they wanted all the results to be equal and to see fairly what year tends to throw the farthest, but they had many disruption and incidents such as one boot was heavier and longer than the other, they all stood in different spots when throwing leading to wrong calculations

Data:

Distance The Gumboot Was Thrown Year9 VS Year11
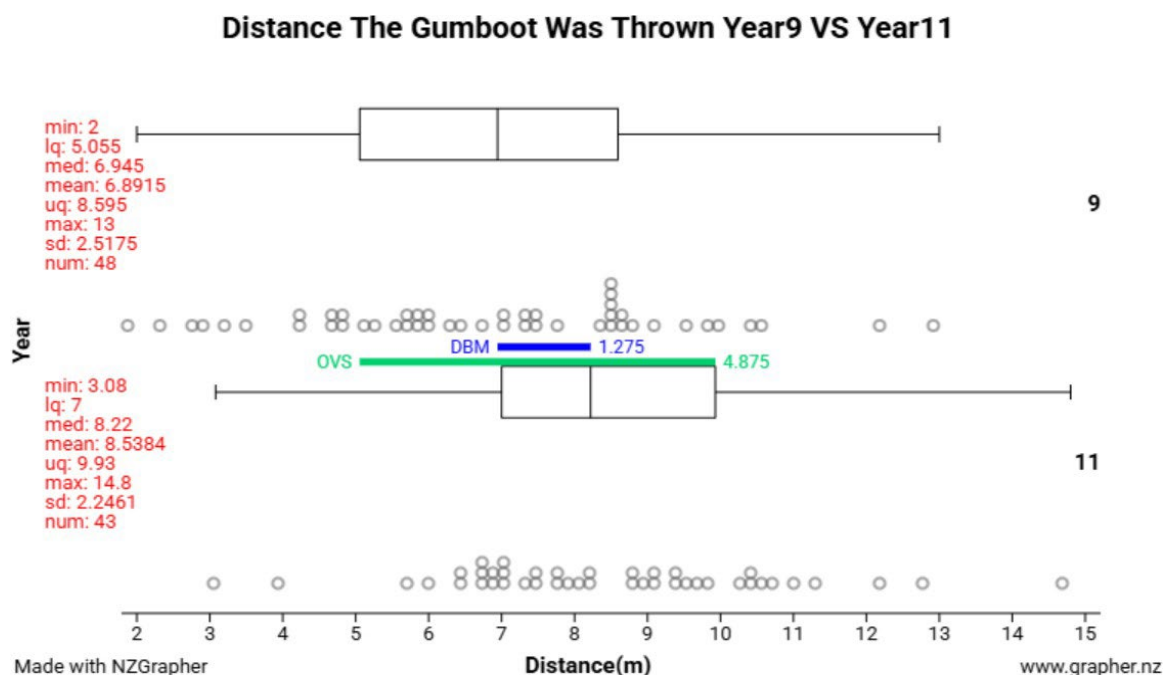
Centre:

In my graph I can see that the two middle 50% for the distance the year 9s threw the gumboot and the distance the year 11s threw the gumboots are overlapping by a big amount. The LQ for the year 9s is 5m which is 2m less than the LQ for the year 11s distance(7m). The medians for the distances are very similar, with the years median being 6.94m and the year 11s median being 8.22m. The middle 50%of the distance the gumboot was thrown for the year 11s is overlapping from the middle 50% of the year9s
My question is asking if the year 11 students tend to throw a gumboot further than students in year 9 for all of the students at █████but the sample shows that the years tend to throw quite far. This could be because the year 9s might have had the lighter boot so it was easier to throw, the measurement could have been taken from the toe of the gumboot,it could have bounced further.

Spread:

In my sample of the distance the gumboot was thrown i can see the variation of the distance that the gumboot was thrown for the year 9s is greater than the variation of the distance that the gumboot was thrown for the year 11s this can be measured by the IQR which is 2.93m for the distance the gumboot was thrown for the year 11s and 3.54m for the distance the year 9s threw the gumboot. There was a bit of a difference (0.61m), it shows slightly on the graph that there is a bit of a difference in the distance. I think it's noticeable that the distance varied more than half a metre more than the other distance is 2.93m. Looking at the overall range in the distance, the year 11s threw the gumboot (14.8m-3.08m=11.72m) compared to the year 9s(13m-22m=11m). This makes sense because there was a recording showing that one of the boots was thrown into a bush and it was still measured or some year 11s that might be stronger than the other younger girls which might decrease the variation.

Shape:
The shape of the distance the year 9s threw the gumboot is left skewed and the shape of the distance the year 11s threw the gumboot is uniform/normal. For the year 9s there is a noticeable peak at around (8.5m) and for the distance the year 11s threw there is no peak but there is a little cluster at 6.7m-7.2m.

Conclusion:
DBM (difference between the medians) is
1.275 OVS (overall visual spread)is 4.875
DBM/OVS=1.275/4.875=0.261
0.2 is the same as 0.2 so I can make the call that one is larger than the other because they are both the same.

Answer:
I can tell the students in year 11 tend to throw a gumboot further than the year 9 students for all the ████ High School students in 2025.

This makes sense because some students could've gotten a longer heavier boot while others could have gotten a lighter boot,some peoples boot might have bounced further and the measurement was taken from where the boot stopped. One of the data collection days

it was raining, some people threw under arm and some threw over arm. This could be why the sample has less variation. This is a good thing because the amount of observations taken could have ruined the outcome if there was less observations taken.