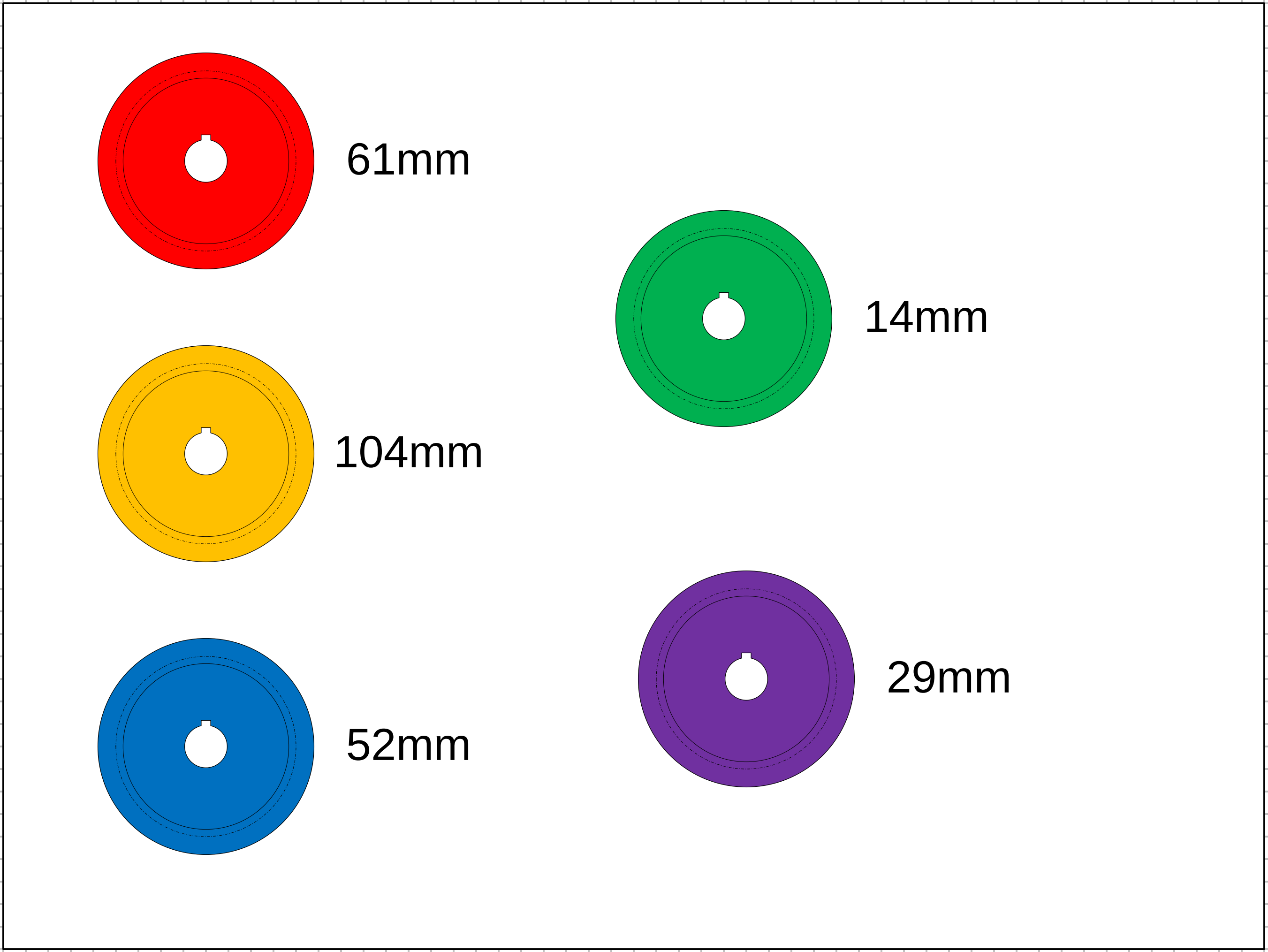
Population is 5 Gears in a Box



61mm

14mm

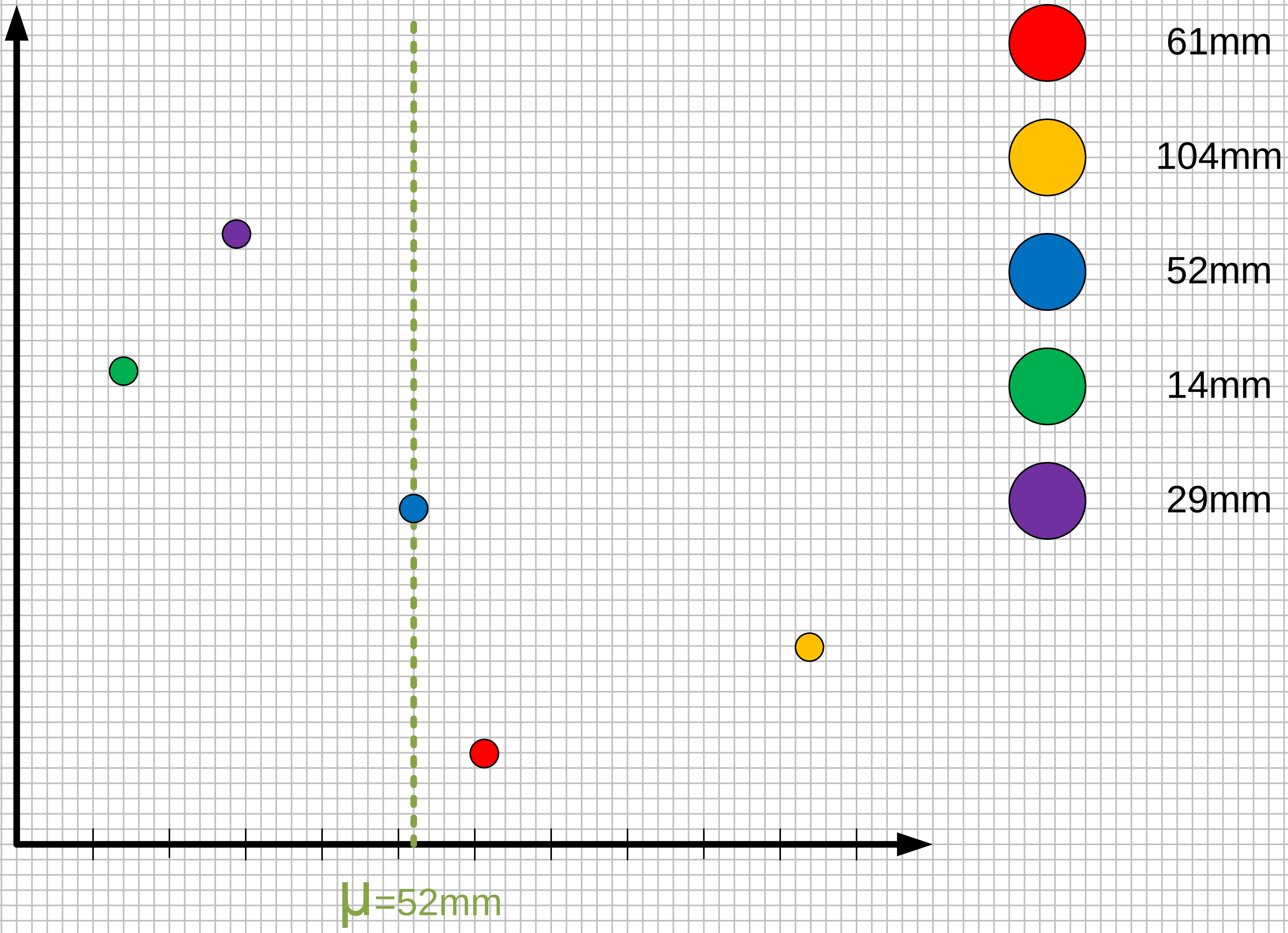
104mm

29mm

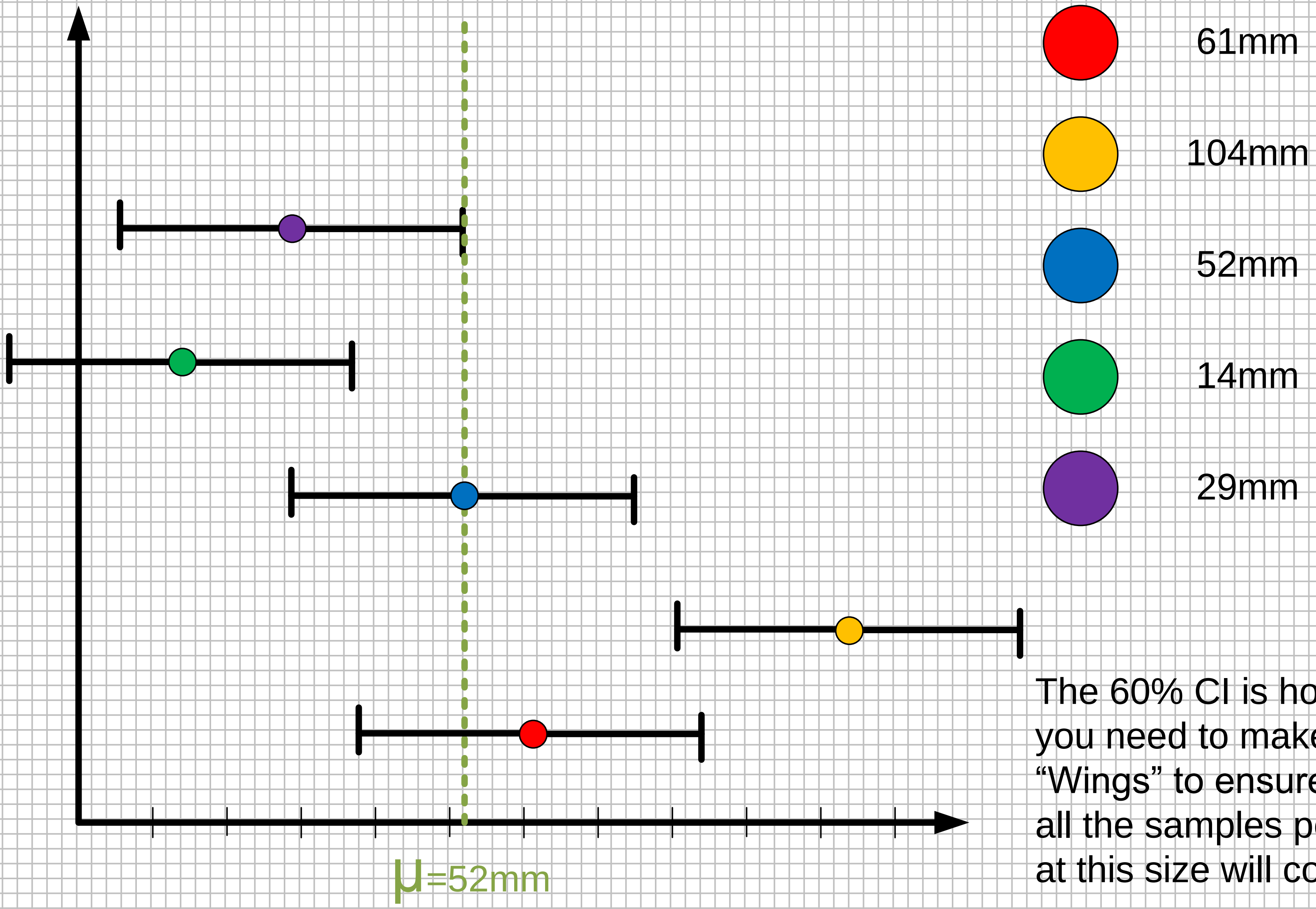
52mm

μ=52mm

There are only 5 ways to sample 1 gear from the population

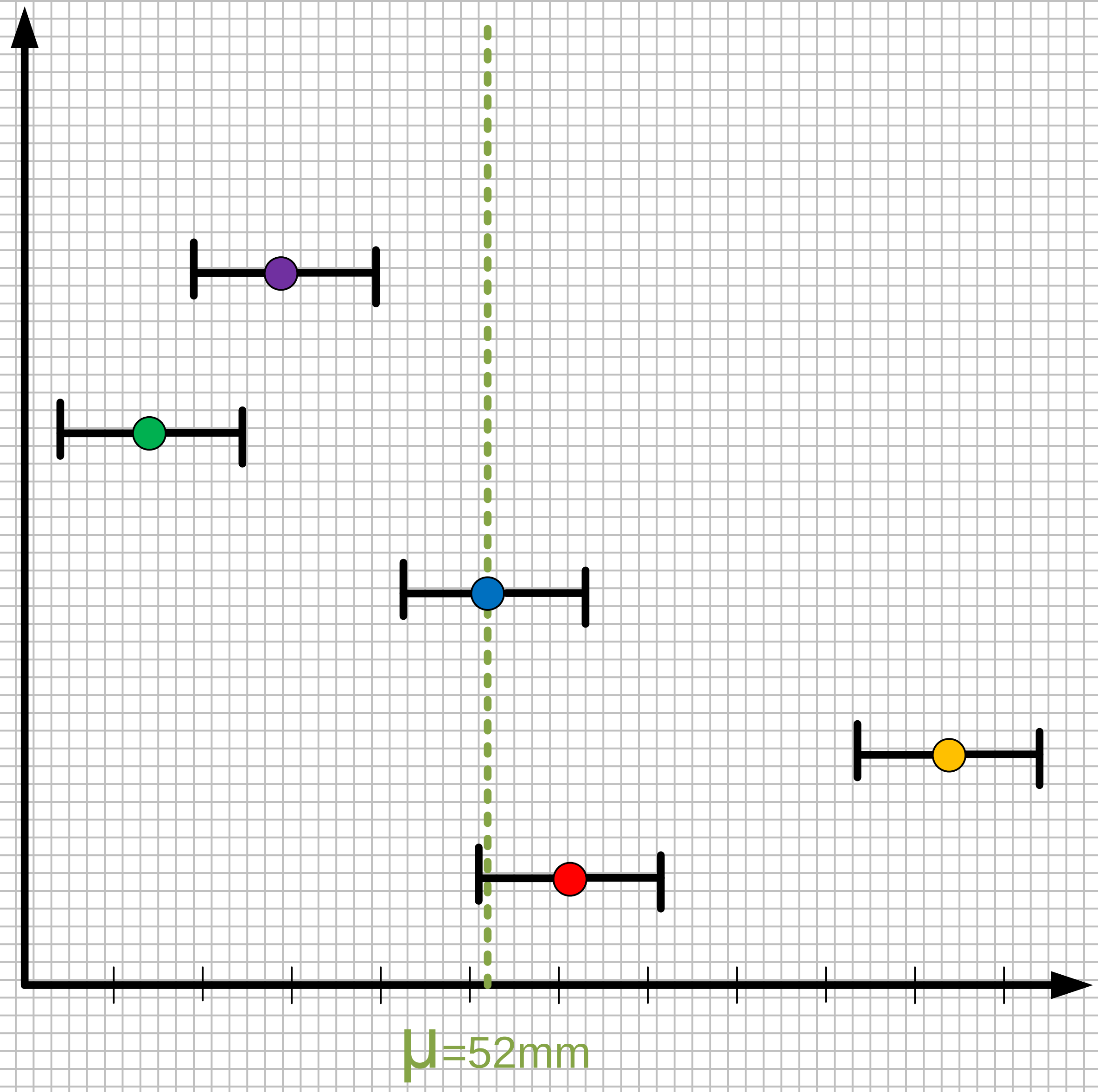


There are only 5 ways to sample 1 gear from the population


61mm
104mm
52mm
14mm
29mm
μ=52mm

The 60% CI is how wide you need to make the "Wings" to ensure 60% of all the samples possible at this size will contain μ

There are only 5 ways to sample 1 gear from the population



🔴 61mm

🟡 104mm

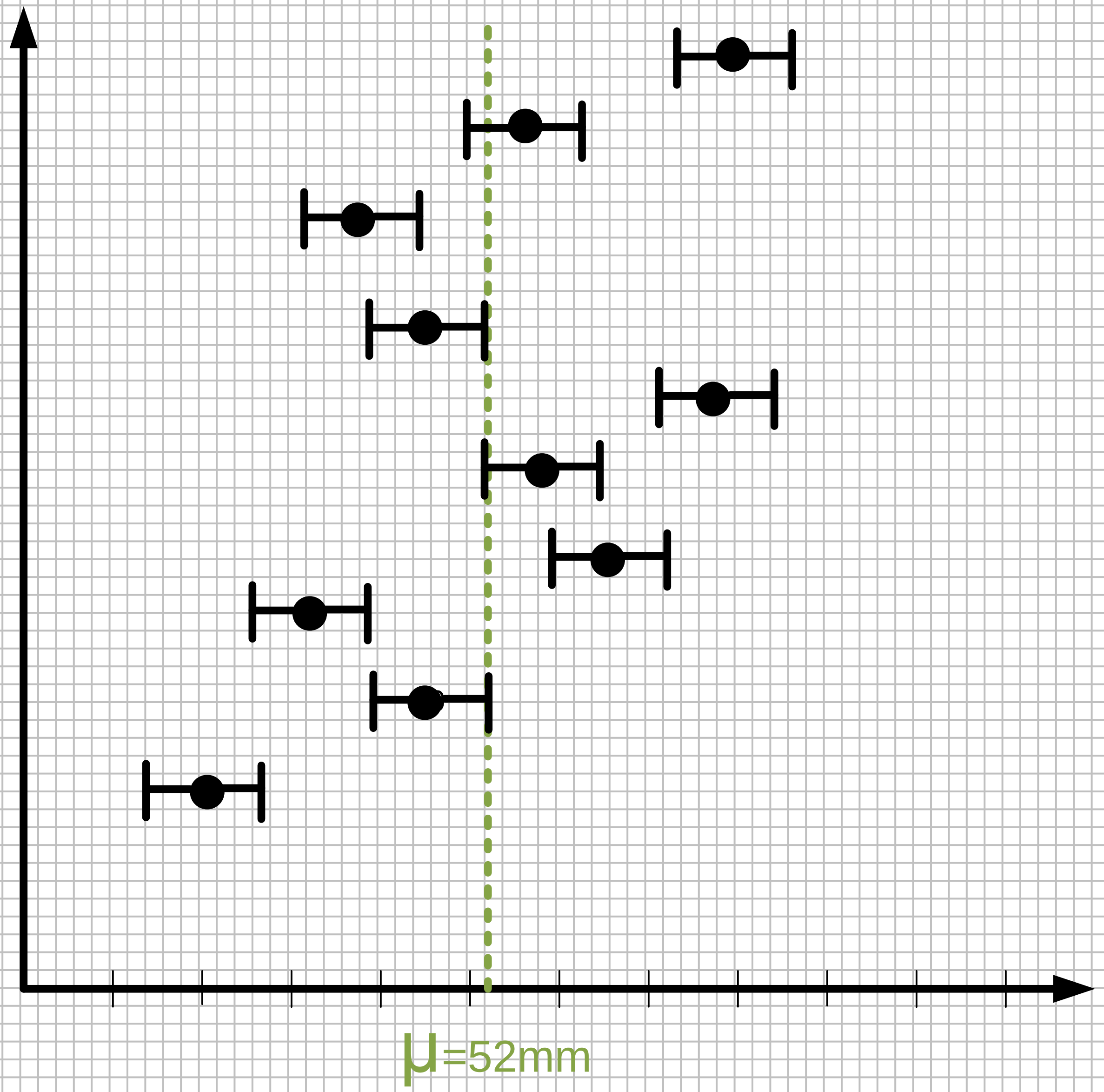
🔵 52mm

🟢 14mm

🟣 29mm

IF you want a lower CI% [like 40%] the “Wings” can get smaller. Likewise a higher CI% requires wider “wings”

There are only 10 ways to sample 2 gears from the population



🔴 🟡 (61+104)/2=82.5

🔴 🔵 (61+52)/2=56.5

🔴 🟢 (61+14)/2=37.5

🔴 🟣 (61+29)/2=45

🟡 🔵 (104+52)/2=78

🟡 🟢 (104+14)/2=59

🟡 🟣 (104+29)/2=66.5

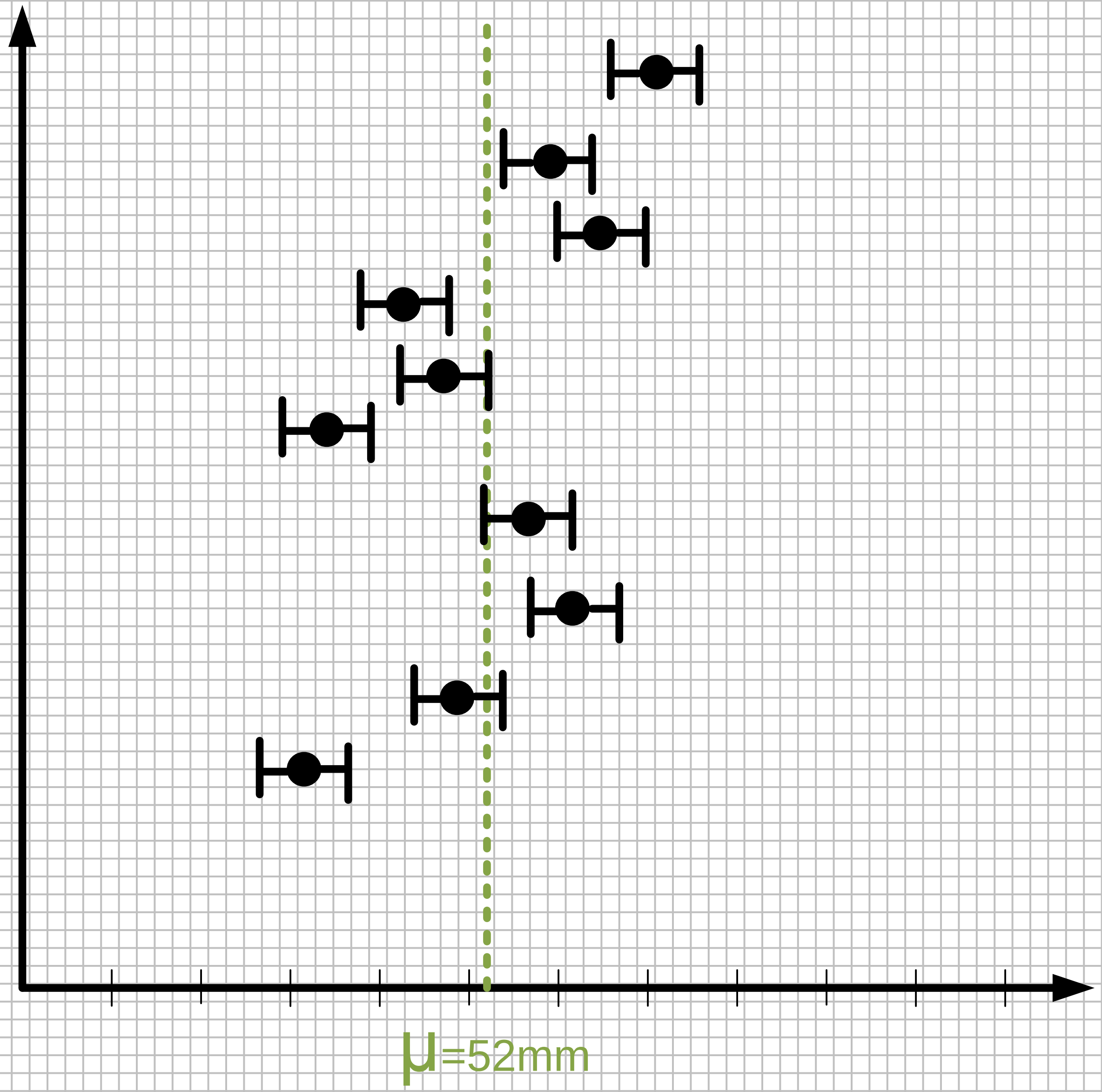
🔵 🟢 (52+14)/2=33

🔵 🟣 (52+29)/2=45.5

🟢 🟣 (14+29)/2=21.5

You can also get smaller ”wings” if you increase the sample size

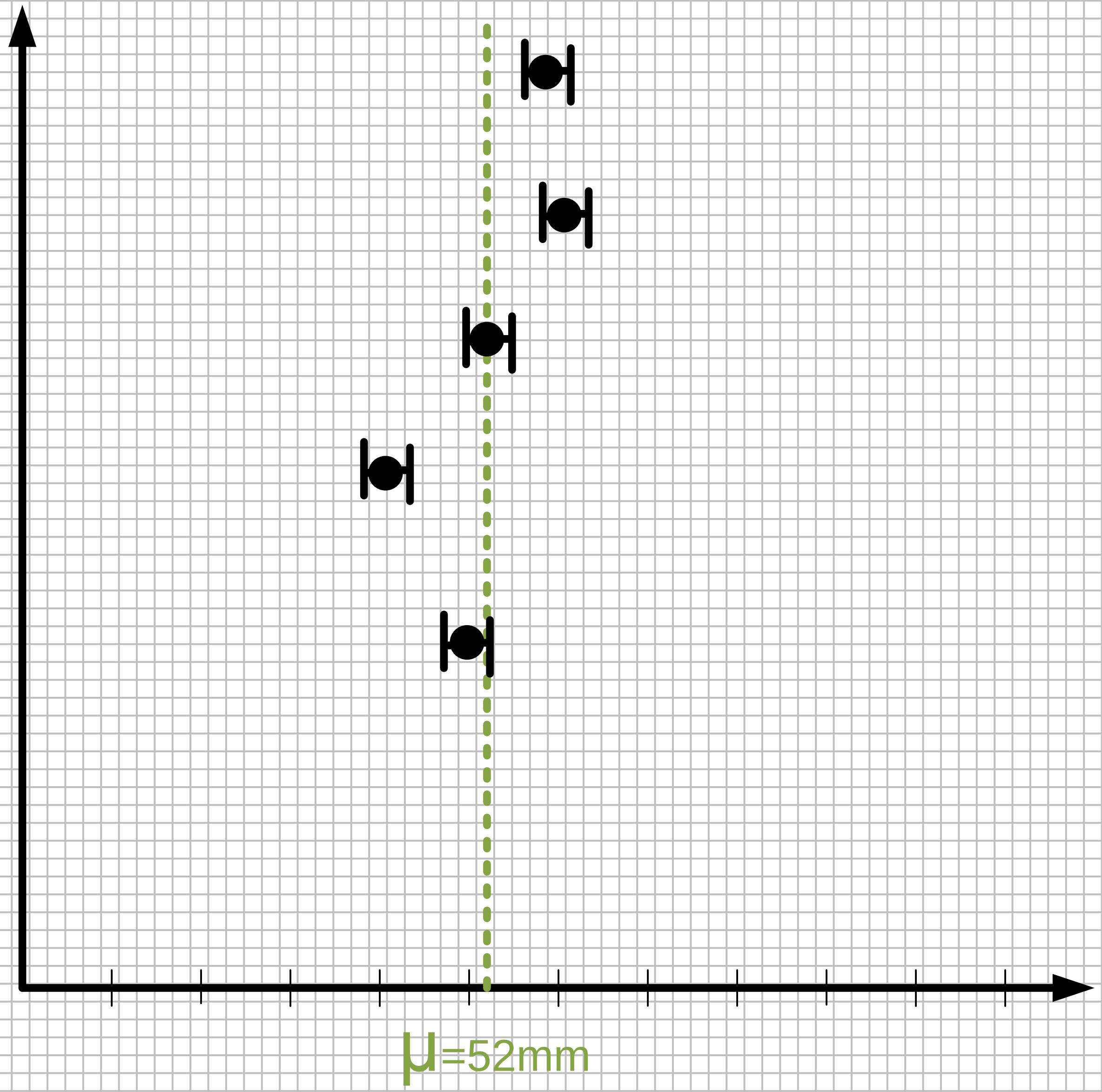
There are only 10 ways to sample 3 gears from the population



🔴	🟡	🔵	72.3
🔴	🟡	🟢	59.7
🔴	🟡	🟣	64.7
🔴	🔵	🟢	42.3
🔴	🔵	🟣	47.3
🔴	🟢	🟣	34.7
🟡	🔵	🟢	57.7
🟡	🔵	🟣	61.7
🟡	🟢	🟣	49
🔵	🟢	🟣	31.7

You can also get smaller ”wings” if you increase the sample size

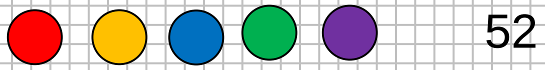
There are only 5 ways to sample 4 gears from the population

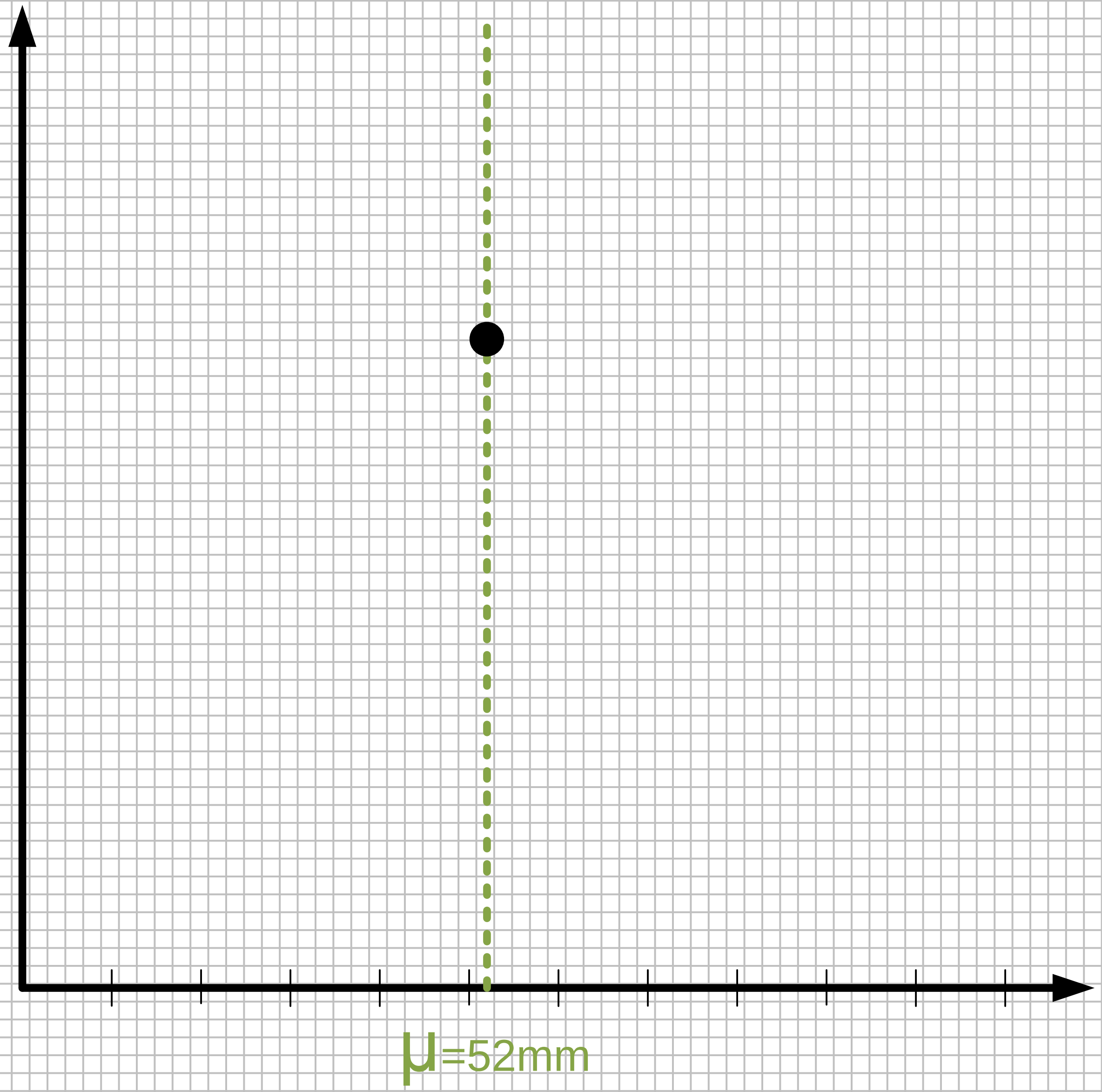


🔴	🟡	🔵	🟢	57.8
🔴	🟡	🔵	🟣	61.5
🔴	🟡	🟢	🟣	52
🔴	🔵	🟢	🟣	39
🟡	🔵	🟢	🟣	49.8

You can also get smaller ”wings” if you increase the sample size

There is only 1 way to sample 5 gears from the population





Until you sample the whole population and you have no wings. You are 100% confident that the population mean is the sample mean at this point