LESSON MAKER PRO

Sample Data Detectives

Use comparative plots and samples to make careful population claims.

GRADE 7 · TEKS 7.12

7.12 "Excerpt: use statistical representations to analyze data"

NAME _____ DATE _____

Read, compare, justify

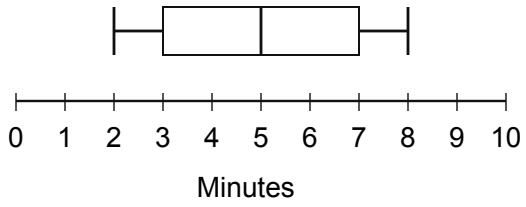
Compare center with the median, and spread with range or IQR (Q3 - Q1). Describe visible clusters, gaps and symmetry. Dot plots show individual observations; box plots show five-number summaries. Random samples support cautious estimates, not certainty.

Worked example

Read Q1 and Q3 from the example box plot. What is its interquartile range?

The left box edge is Q1 = 3 minutes; the right box edge is Q3 = 7 minutes. Subtract the two quartiles: IQR = 7 - 3 = 4 minutes. The middle half spans 4 minutes.

Example sample



Use the printed plots and tables. Name both groups, include units, and support each comparison with values. Refer back to a numbered task when directed.

1. Estimate a population count

A simple random sample of 30 of the school's 240 students gives these results. Estimate how many students may want longer recess. Show the sample fraction and calculation.

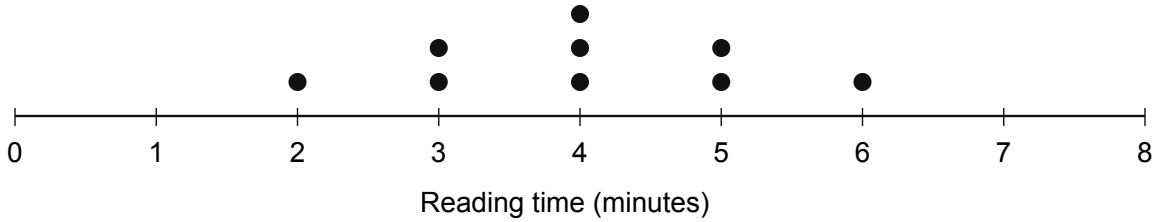
Data table

Response	Students
Longer recess	18
No longer recess	12

2. Compare the dot plots

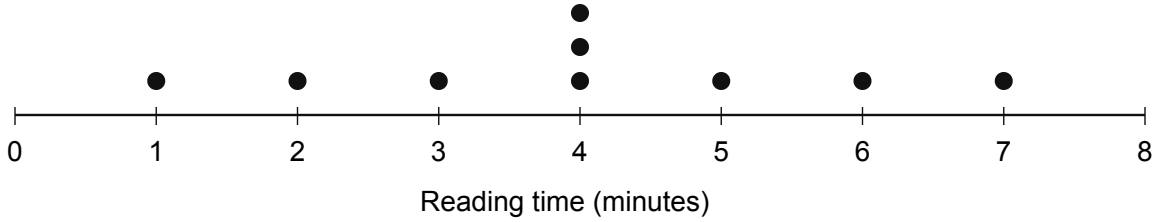
Each club randomly samples 9 members for weekday reading time. Find both medians and ranges. Which sample has more variable times?

North club: random sample



Key: one dot = one observation

South club: random sample



Key: one dot = one observation

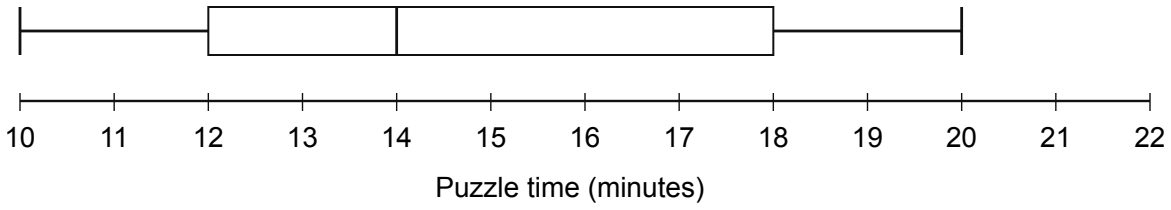
3. Describe shape and limit the claim

Use the two dot plots in Task 2. Compare their shapes. Does the evidence prove every South member reads less than every North member? Explain.

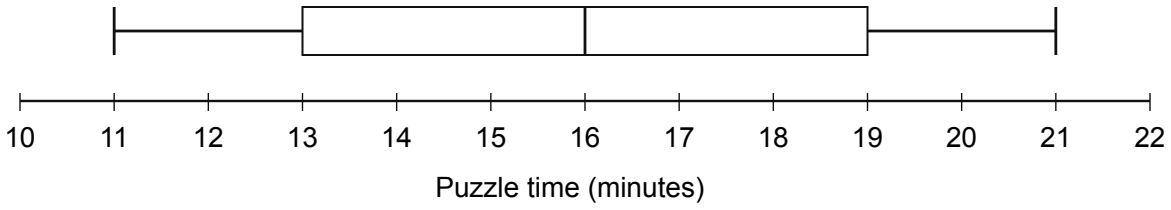
4. Compare box plots and infer

Each club randomly samples 7 members for puzzle completion time. Use the plots to compare medians and IQRs. Make one cautious inference about the clubs.

Nova club: random sample



Pixel club: random sample



5. Evaluate a stronger claim

Use Task 4. A student says every Pixel member is slower than every Nova member. Explain why that conclusion is unsupported, using one feature of the plots and one sampling limitation.

6. Same proportion, different counts

The table summarizes independent simple random samples about a festival. Estimate interested students at each school. Does Creek have a higher estimated proportion? Explain.

Data table

School size	Sample size	Interested
Creek: 500	25	15
Ridge: 350	20	12

7. Question the sampling method

A student surveys only members of the recess sports club and uses their answers to estimate the whole school's preference. Explain why this may be biased and propose a better method.

Sample Data Detectives

TEACHER NOTES

All club samples are explicitly random; avoid claiming a sample proves a population fact. Box plots use medians of the lower and upper halves, excluding the overall median for odd sample sizes. Whiskers show min/max. Distinguish percent from count; sampling may vary.

TASK 1

18/30 = 0.6; 0.6 x 240 = about 144 students. It is an estimate from a sample.

TASK 2

Both medians are 4 minutes. North range: 6 - 2 = 4; South: 7 - 1 = 6 minutes. South is more variable by range.

TASK 3

Both plots are symmetric around 4, with the tallest stack at 4. North is more tightly clustered; South is wider. No: the samples overlap and do not describe every member.

TASK 4

Nova median 14, Q1 12, Q3 18, IQR 6 minutes. Pixel median 16, Q1 13, Q3 19, IQR 6 minutes. The samples suggest Pixel may take longer typically; their middle-half spreads are equal. Check that the representation and explanation agree with the given quantities.

TASK 5

The displayed ranges overlap (Nova 10-20, Pixel 11-21 minutes). Only 7 members from each club were sampled; a typical-time comparison does not establish an ordering for every member. Check that the representation and explanation agree with the given quantities.

TASK 6

Creek: 15/25 = 60%; about 300 of 500. Ridge: 12/20 = 60%; about 210 of 350. Same estimated proportion, but different counts because school sizes differ. Use the sample information to justify a cautious conclusion.

TASK 7

Sports-club members may favor longer recess more than other students. Randomly select students from the entire school roster, giving every student a chance to be chosen.