Summarizing Data and Making Comparisons

Summarizing and comparing data: Applications and decisions

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Compare groups using the same measure and units. For A: $4, 5, 6$ and B: $1, 5, 9$, both means are 5, but ranges are 2 and 8, so A is more consistent by range. A larger mean is not always better: for wait times, a smaller mean is usually preferred. State the criterion rather than making an unsupported overall judgment.

Worked example

Find center and range; choose the more consistent group. A: $4, 5, 6$. B: $1, 5, 9$. Use the range for the decision.

1. A sum $= 15$, count 3, mean $= 15/3 = 5$; sorted $4, 5, 6$ gives median 5.
2. B sum $= 15$, count 3, mean $= 15/3 = 5$; sorted $1, 5, 9$ gives median 5.
3. Ranges: A $= 6 - 4 = 2$; B $= 9 - 1 = 8$. A is more consistent by range.
Answer: A: mean 5, median 5, range 2. B: mean 5, median 5, range 8. A is more consistent by range.

Practice Problems

Show your thinking.

1. A school needs reliable trip times, in minutes. Choose by consistency. A: $8, 10, 12$. B: $9, 10, 11$. Use the range for the decision.

2. A grower wants the greater average plant height, in cm. A: $12, 14, 16$. B: $13, 15, 17$. Use the mean for the decision.

3. Design a report comparing ordinary wait times by the median. A: $2, 3, 19$. B: $5, 6, 7$. Use the median for the decision.

4. Two machines have equal mean fill. Choose less variable output by range. A: $20, 22, 24$. B: $16, 22, 28$. Use the range for the decision.

5. A manager says equal means make the machines equally consistent. Correct the claim. A: $4, 8, 12$. B: $7, 8, 9$. Use the range for the decision.

6. Recover which reading club has the greater mean book count. A: $5, 6, 7, 8$. B: $7, 8, 9, 10$. Use the mean for the decision.

Answer Key

1. A: mean 10, median 10, range 4. B: mean 10, median 10, range 2. B is more consistent by range.
2. A: mean 14, median 14, range 4. B: mean 15, median 15, range 4. B has the greater mean.
3. A: mean 8, median 3, range 17. B: mean 6, median 6, range 2. B has the greater median.
4. A: mean 22, median 22, range 4. B: mean 22, median 22, range 12. A is more consistent by range.
5. A: mean 8, median 8, range 8. B: mean 8, median 8, range 2. B is more consistent by range.
6. A: mean $\frac{13}{2}$, median $\frac{13}{2}$, range 3. B: mean $\frac{17}{2}$, median $\frac{17}{2}$, range 3. B has the greater mean.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. A sum $= 30$, count 3, mean $= 30/3 = 10$; sorted $8, 10, 12$ gives median 10.
2. B sum $= 30$, count 3, mean $= 30/3 = 10$; sorted $9, 10, 11$ gives median 10.
3. Ranges: A $= 12 - 8 = 4$; B $= 11 - 9 = 2$. B is more consistent by range.

Problem 2

1. A sum $= 42$, count 3, mean $= 42/3 = 14$; sorted $12, 14, 16$ gives median 14.
2. B sum $= 45$, count 3, mean $= 45/3 = 15$; sorted $13, 15, 17$ gives median 15.
3. Ranges: A $= 16 - 12 = 4$; B $= 17 - 13 = 4$. B has the greater mean.

Problem 3

1. A sum $= 24$, count 3, mean $= 24/3 = 8$; sorted $2, 3, 19$ gives median 3.
2. B sum $= 18$, count 3, mean $= 18/3 = 6$; sorted $5, 6, 7$ gives median 6.
3. Ranges: A $= 19 - 2 = 17$; B $= 7 - 5 = 2$. B has the greater median.

Problem 4

1. A sum $= 66$, count 3, mean $= 66/3 = 22$; sorted $20, 22, 24$ gives median 22.
2. B sum $= 66$, count 3, mean $= 66/3 = 22$; sorted $16, 22, 28$ gives median 22.
3. Ranges: A $= 24 - 20 = 4$; B $= 28 - 16 = 12$. A is more consistent by range.

Problem 5

1. A sum $= 24$, count 3, mean $= 24/3 = 8$; sorted $4, 8, 12$ gives median 8.
2. B sum $= 24$, count 3, mean $= 24/3 = 8$; sorted $7, 8, 9$ gives median 8.
3. Ranges: A $= 12 - 4 = 8$; B $= 9 - 7 = 2$. B is more consistent by range.

Problem 6

1. A sum $= 26$, count 4, mean $= 26/4 = \frac{13}{2}$; sorted $5, 6, 7, 8$ gives median $\frac{13}{2}$.
2. B sum $= 34$, count 4, mean $= 34/4 = \frac{17}{2}$; sorted $7, 8, 9, 10$ gives median $\frac{17}{2}$.
3. Ranges: A $= 8 - 5 = 3$; B $= 10 - 7 = 3$. B has the greater mean.

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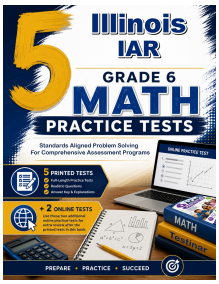

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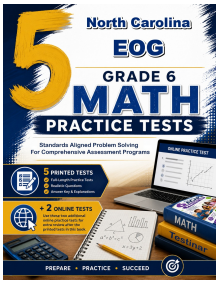

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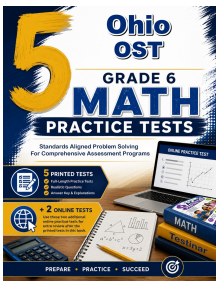

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