Data Displays Extended

Choosing and checking data displays: Models and calculations

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

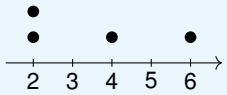
QUICK REVIEW

Choose a display for the data and question. Dot/stem plots preserve individual values; histograms group intervals; box plots show a five-number summary; circle graphs compare categories within one whole. For $2, 2, 4, 6$, a dot plot retains all four values, a box plot has median $(2 + 4)/2 = 3$, and a frequency total must still be 4.

Worked example

Preserve each exact observation. Data: $2, 2, 4, 6$. Draw one dot per observation, then give every nonzero frequency.

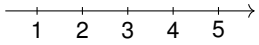
1. Tally each value separately: $2 : 2, 4 : 1, 6 : 1$.
2. Total dots $= 2 + 1 + 1 = 4$; repeated values each contribute a dot.
3. Range $= 6 - 2 = 4$.
Answer: Value:frequency $2 : 2, 4 : 1, 6 : 1$; total 4; range 4.



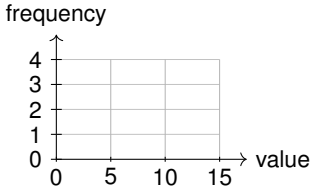
Practice Problems

Show your thinking.

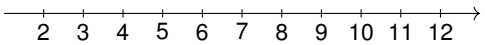
1. Choose and construct a display that preserves each small integer value. Data: $1, 2, 2, 4, 5, 5$. Draw one dot per observation, then give every nonzero frequency.



2. Choose grouped intervals rather than individual values and build the display. Intervals are $0 \le x < 5$, $5 \le x < 10$, $10 \le x < 15$. Data: $1, 3, 5, 7, 9, 11, 14$. Draw touching bars and give their heights.



3. Choose a summary display that highlights quartiles. Data: $2, 4, 6, 8, 10, 12$. Draw the box plot and state the five-number summary, IQR, and range.

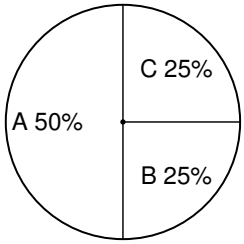


4. Choose a display that preserves exact two-digit measurements. Data: $12, 15, 18, 21, 24, 27$. Construct the plot, then find count, median, and range.

Stem	Leaves
1	
2	

Key: $2 \mid 3 = 23$.

5. Read a whole divided into categories. There are 40 observations. Use the labeled graph to find each category count and sector angle.



6. A survey has 6 observations: $2, 2, 3, 4, 4, 5$. A histogram claims interval counts $2, 3$ for a complete two-interval partition. Can it be complete?

Answer Key

1. Value:frequency $1:1, 2:2, 4:1, 5:2$; total 6; range 4.
2. Bar heights $2, 3, 2$; total 7.
3. Min 2, $Q_1 = 4$, median 7, $Q_3 = 10$, max 12; IQR 6; range 10.
4.

Stem	Leaves
1	2 5 8
2	1 4 7

Key: $2 \mid 3 = 23$. Count 6; median $\frac{39}{2}$; range 15.
5. Counts A: 20, B: 10, C: 10. Angles A: $180°$, B: $90°$, C: $90°$.
6. No; one observation is missing.

Step-by-Step Solutions

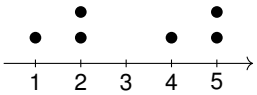
Follow each calculation, then check your own work.

Problem 1

1. Tally each value separately: $1:1, 2:2, 4:1, 5:2$.

2. Total dots $= 1 + 2 + 1 + 2 = 6$; repeated values each contribute a dot.

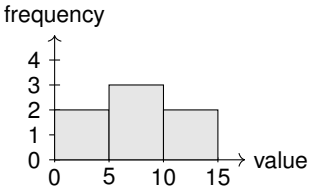
3. Range $= 5 - 1 = 4$.



Problem 2

1. Count data in each interval: $0 \le x < 5 : 2$; $5 \le x < 10 : 3$; $10 \le x < 15 : 2$.

2. Total frequency $= 2 + 3 + 2 = 7$. Boundary values enter the interval beginning at that value, not the preceding one.

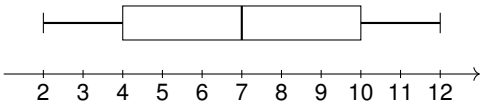


Problem 3

1. Sort: $2, 4, 6, 8, 10, 12$. Average positions 3 and 4: $(6+8)/2 = 7$.

2. Lower half $2, 4, 6$ gives $Q_1 = 4$; upper half $8, 10, 12$ gives $Q_3 = 10$.

3. The whiskers end at $2, 12$; box width $= 10 - 4 = 6$ and full range $= 12 - 2 = 10$.



Problem 4

1. Use tens as stems and ones as leaves: $12 = 10 \times 1 + 2$; $27 = 10 \times 2 + 7$.

2. Stem frequencies are $1:3$, $2:3$; total leaves 6.

3. Sorted values: $12, 15, 18, 21, 24, 27$. Average the values in positions 3 and 4: $(18 + 21)/2 = \frac{39}{2}$ for the median. Range $= 27 - 12 = 15$.

Problem 5

1. The percentages total $50\% + 25\% + 25\% = 100\%$.

2. Counts: $40 \times 50/100 = 20$; $40 \times 25/100 = 10$; $40 \times 25/100 = 10$.

3. Sector angles: $360 \times 50/100 = 180°$; $360 \times 25/100 = 90°$; $360 \times 25/100 = 90°$. Counts total 40; angles total $360°$.

Problem 6

1. Listed bar counts total $2 + 3 = 5$.

2. The data list contains 6 observations, so $6 - 5 = 1$ is missing.

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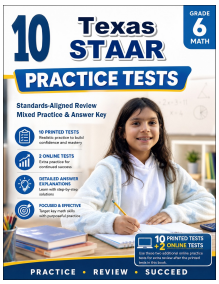

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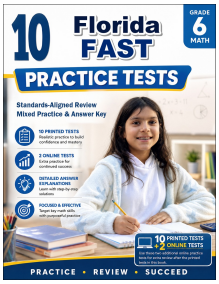

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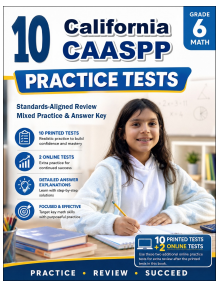

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