Stem-and-Leaf Plots

Stem-and-leaf plots: Applications and decisions

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QUICK REVIEW

A stem-and-leaf plot keeps every exact value. With key $2 \mid 3 = 23$, $21, 23, 23, 35$ become stem 2 with leaves $1, 3, 3$ and stem 3 with leaf 5. Sort leaves and retain repeats. The four observations have median $(23 + 23)/2 = 23$ and range $35 - 21 = 14$.

Worked example

Organize the observations. Data: $21, 23, 23, 35$. Construct the plot, then find count, median, and range.

1. Use tens as stems and ones as leaves: $21 = 10 \times 2 + 1$; $35 = 10 \times 3 + 5$.

2. Stem frequencies are $2 : 3$, $3 : 1$; total leaves 4.

3. Sorted data $21, 23, 23, 35$ give median 23 and range $35 - 21 = 14$.

Answer:

Stem	Leaves
2	1 3 3
3	5

Key: $2 \mid 3 = 23$.

Count 4; median 23; range 14.

Stem	Leaves
2	
3	

Key: $2 \mid 3 = 23$.

Practice Problems

Show your thinking.

1. Design a display for travel times in minutes. Data: $21, 23, 23, 26, 32, 35$. Construct the plot, then find count, median, and range.

Stem	Leaves
2	
3	

Key: $2 \mid 3 = 23$.

2. Read exact plant heights in cm rather than interval counts. Read the plot, rewrite the values in order, and find count, median, and range.

Stem	Leaves
1	2 6 9
2	0 5 8

Key: $2 \mid 3 = 23$.

3. Construct a display for daily pages read. Data: $30, 32, 36, 41, 44, 48$. Construct the plot, then find count, median, and range.

Stem	Leaves
3	
4	

Key: $2 \mid 3 = 23$.

4. A report drops one repeated delivery time. Construct a corrected plot. Data: $15, 18, 18, 24, 27, 31$. Construct the plot, then find count, median, and range.

Stem	Leaves
1	
2	
3	

Key: $2 \mid 3 = 23$.

5. Recover the survey observations and median from the plot. Read the plot, rewrite the values in order, and find count, median, and range.

Stem	Leaves
2	2 4 7
3	3 6

Key: $2 \mid 3 = 23$.

6. Explain the zero leaves and summarize the distribution. Read the plot, rewrite the values in order, and find count, median, and range.

Stem	Leaves
1	0 5
2	1 6
3	0 5

Key: $2 \mid 3 = 23$.

Answer Key

1.

Stem	Leaves
2	1 3 3 6
3	2 5

Key: $2 \mid 3 = 23$.
Count 6; median $\frac{49}{2}$; range 14.

2.

Stem	Leaves
1	2 6 9
2	0 5 8

Key: $2 \mid 3 = 23$.
Count 6; median $\frac{39}{2}$; range 16.

3.

Stem	Leaves
3	0 2 6
4	1 4 8

Key: $2 \mid 3 = 23$.
Count 6; median $\frac{77}{2}$; range 18.

4.

Stem	Leaves
1	5 8 8
2	4 7
3	1

Key: $2 \mid 3 = 23$.
Count 6; median 21; range 16.

5.

Stem	Leaves
2	2 4 7
3	3 6

Key: $2 \mid 3 = 23$.
Count 5; median 27; range 14.

6.

Stem	Leaves
1	0 5
2	1 6
3	0 5

Key: $2 \mid 3 = 23$.
Count 6; median $\frac{47}{2}$; range 25.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Use tens as stems and ones as leaves: $21 = 10 \times 2 + 1$; $35 = 10 \times 3 + 5$.

2. Stem frequencies are $2 : 4$, $3 : 2$; total leaves 6.

3. Sorted data $21, 23, 23, 26, 32, 35$ give median $\frac{49}{2}$ and range $35 - 21 = 14$.

Problem 2

1. Use tens as stems and ones as leaves: $12 = 10 \times 1 + 2$; $28 = 10 \times 2 + 8$.

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

3. Sorted data $12, 16, 19, 20, 25, 28$ give median $\frac{39}{2}$ and range $28 - 12 = 16$.

Problem 3

1. Use tens as stems and ones as leaves: $30 = 10 \times 3 + 0$; $48 = 10 \times 4 + 8$.

2. Stem frequencies are $3 : 3$, $4 : 3$; total leaves 6.

3. Sorted data $30, 32, 36, 41, 44, 48$ give median $\frac{77}{2}$ and range $48 - 30 = 18$.

Problem 4

1. Use tens as stems and ones as leaves: $15 = 10 \times 1 + 5$; $31 = 10 \times 3 + 1$.

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

3. Sorted data $15, 18, 18, 24, 27, 31$ give median 21 and range $31 - 15 = 16$.

Problem 5

1. Use tens as stems and ones as leaves: $22 = 10 \times 2 + 2$; $36 = 10 \times 3 + 6$.

2. Stem frequencies are $2 : 3$, $3 : 2$; total leaves 5.

3. Sorted data $22, 24, 27, 33, 36$ give median 27 and range $36 - 22 = 14$.

Problem 6

1. Use tens as stems and ones as leaves: $10 = 10 \times 1 + 0$; $35 = 10 \times 3 + 5$.

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

3. Sorted data $10, 15, 21, 26, 30, 35$ give median $\frac{47}{2}$ and range $35 - 10 = 25$.

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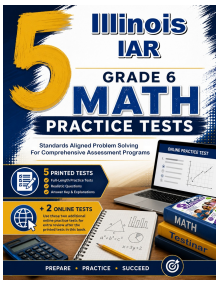

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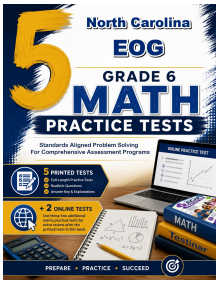

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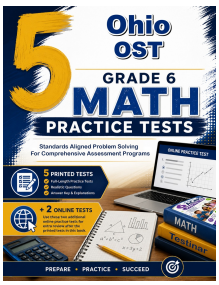

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