

## Box And Whisker Plot Worksheet Questions and Answers PDF

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### Part 1: Building a Foundation

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**What is the primary purpose of a box and whisker plot?**

*Hint: Think about what information this type of plot conveys.*

- A) To show the frequency of data points
- B) To display the distribution of a data set ✓
- C) To compare two different data sets
- D) To calculate the mean of a data set

■ The primary purpose of a box and whisker plot is to display the distribution of a data set.

**Which of the following are components of a box and whisker plot? (Select all that apply)**

*Hint: Consider the key elements that make up the plot.*

- A) Mean
- B) Median ✓
- C) Lower Quartile (Q1) ✓
- D) Upper Quartile (Q3) ✓

■ The components of a box and whisker plot include the median, lower quartile (Q1), and upper quartile (Q3).

**Describe what the 'whiskers' in a box and whisker plot represent.**

*Hint: Think about the range of the data outside the quartiles.*

**The whiskers in a box and whisker plot represent the range of the data outside the interquartile range, extending to the minimum and maximum values.**

**List the steps to calculate the interquartile range (IQR) of a data set.**

*Hint: Consider the process of finding quartiles.*

1. Step 1: Arrange the data in ascending order.

**Sort the data from smallest to largest.**

2. Step 2: Find Q1 (the first quartile).

**Locate the median of the lower half of the data.**

3. Step 3: Find Q3 (the third quartile).

**Locate the median of the upper half of the data.**

4. Step 4: Calculate IQR.

**Subtract Q1 from Q3.**

To calculate the IQR, find Q1 and Q3, then subtract Q1 from Q3.

## Part 2: Understanding and Interpretation

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**If the median of a data set is closer to the lower quartile than the upper quartile, what does this indicate about the data distribution?**

*Hint: Think about the symmetry of the data.*

- A) The data is skewed to the right
- B) The data is skewed to the left ✓
- C) The data is symmetric
- D) The data has no skew

If the median is closer to the lower quartile, it indicates that the data is skewed to the left.

**Which statements are true about the interquartile range (IQR)? (Select all that apply)**

*Hint: Consider the properties of the IQR.*

- A) It measures the spread of the middle 50% of the data ✓
- B) It is affected by outliers
- C) It is calculated as Q3 minus Q1 ✓
- D) It represents the average of the data set

The IQR measures the spread of the middle 50% of the data and is calculated as Q3 minus Q1.

**Explain how outliers are represented in a box and whisker plot.**

*Hint: Think about the visual representation of data points.*

Outliers are represented as individual points that fall outside the whiskers of the box and whisker plot.

### Part 3: Application and Analysis

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Given a data set with the following values: 3, 7, 8, 12, 13, 14, 18, 21, 23, 27, what is the median?

Hint: Remember how to find the median in a sorted list.

- A) 12
- B) 13
- C) 14 ✓
- D) 15

The median of the data set is 14.

You have a box and whisker plot with a median of 50, Q1 of 30, and Q3 of 70. Which of the following statements are true? (Select all that apply)

Hint: Consider the definitions of median, Q1, and Q3.

- A) The interquartile range is 40 ✓
- B) The plot is symmetric
- C) The minimum value is 30 ✓
- D) The maximum value is 70

The interquartile range is 40, and the minimum value is 30.

Create a box and whisker plot for the following data set: 5, 7, 8, 12, 15, 18, 22, 24, 30. Describe each step of your process.

Hint: Think about how to organize and visualize the data.

**To create the plot, first find the quartiles, then draw the box and whiskers based on the data.**

**If a box and whisker plot shows a long whisker on the right side, what can be inferred about the data?**

*Hint: Consider the implications of whisker length.*

- A) The data is skewed to the left
- B) The data is skewed to the right ✓
- C) The data is symmetric
- D) The data has no skew

A long whisker on the right side indicates that the data is skewed to the right.

## Part 4: Evaluation and Creation

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**Which of the following changes would most likely reduce the interquartile range of a data set?**

*Hint: Think about how data points affect the spread.*

- A) Adding more data points at the extremes
- B) Removing outliers ✓
- C) Increasing the number of data points in the middle range
- D) Decreasing the overall number of data points

Removing outliers would most likely reduce the interquartile range of a data set.

**Consider a box and whisker plot that represents the ages of participants in a study. If the median age is significantly lower than the mean age, what might this suggest? (Select all that apply)**


*Hint: Think about the implications of the relationship between median and mean.*

- A) The data is skewed to the right ✓
- B) There are several young outliers ✓
- C) The data is skewed to the left
- D) There are several older outliers

If the median is lower than the mean, it suggests that the data is skewed to the right and there are several young outliers.

**Design a box and whisker plot for a hypothetical data set that represents a scenario of your choice. Explain your choice of data points and the story they tell.**

*Hint: Think creatively about the data you want to represent.*



**The design should reflect a clear scenario, with data points chosen to illustrate a specific story.**