Lesson 21
Box Plots

NAME:

Start by navigating to the Online Lesson for instructions.

Objectives

- Determine the five-number summary from a box plot
- Given a set of data, construct a box plot with appropriate labels

Why?

Box plots are useful in showing the spread of the data. Using the five-number summary, you can describe a data set without looking at every number. Constructing and labeling a box plot helps you visually compare data sets, spot outliers, and understand patterns like symmetry or skewness. These are skills that are important for analyzing real-world information and making informed decisions.

Explore

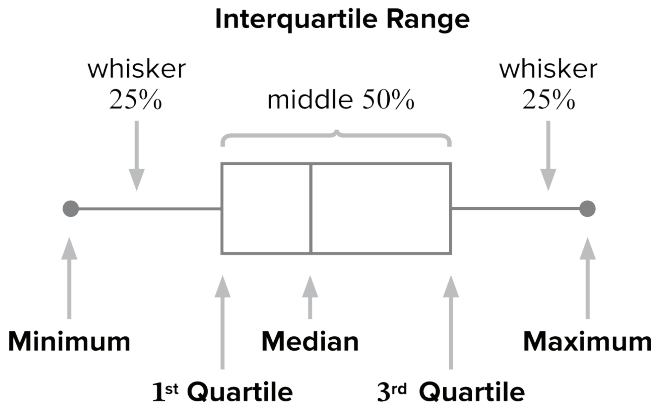
Box Plots

Fill in the guided notes as you watch the video in the Online Lesson.

- _____ divide data sets into four parts, each with the _____ number of elements.
- Box Plots allow us to visualize _____ and _____.

Five-Number Summary:

- A quartile is a _____ of the data set.
  - The _____ value of the data set is the smallest number in the data set.
  - The _____, Q1, is the median of the lower half of the data set; 25% of the data falls below it.
  - The _____ value of the data set is Q2.
  - The _____, Q3, is the median of the upper half of the data; 25% of the data falls above it.
  - The _____ value of the data set is the largest number in the data set.

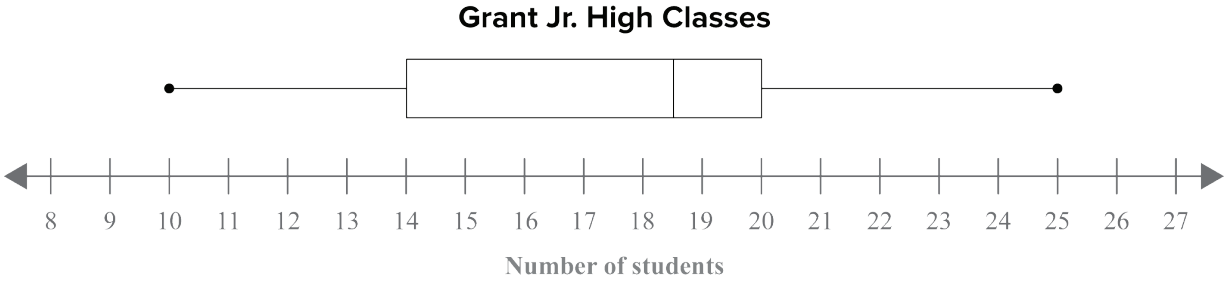


- Measures of spread:
  - The _____ represents the spread of the middle 50% of the data set and measures the spread based on the median value ($Q2$).
  - To find the interquartile range: _____
  - _____ is found by subtracting the minimum value from the maximum value.
- To construct a box plot, calculate the _____:
  - Minimum, (min)
  - Lower quartile, $Q1$
  - Median, $Q2$
  - Upper quartile, $Q3$
  - Maximum, (max)
- The median, $Q2$, is the middle number in the data set but is _____ _____ in the middle of the box when graphed.
- In a box plot, the box represents the _____ of the data elements.
- The _____ are drawn from the minimum to the first quartile and from the third quartile to the maximum.

Example 1

Complete the example as you watch the video in the Online Lesson.

Determine the five-number summary, interquartile range, and range from a box plot.



Example 2

Complete the example as you watch the video in the Online Lesson.

Calculate the five-number summary, interquartile range, and range.

Brianna calculated the temperature at 8:00 am every morning for ten days. Her results in degrees Celsius: $\{15, 13, 16, 13, 18, 15, 20, 19, 19, 16\}$

Plan:

Write the data set in order.

Calculate the median (Q2).

Calculate Q1.

Calculate Q3.

Determine the min and max.

Calculate the IQR and Range.

Example 3

Complete the example as you watch the video in the Online Lesson.

Construct a box plot.

Oklahoma's Basketball Team won a championship in seven games. Their final score in each game was: $\{110, 123, 107, 111, 120, 101, 103\}$.

Plan:

Write the data set in order.

Calculate the median (Q2).

Calculate Q1.

Calculate Q3.

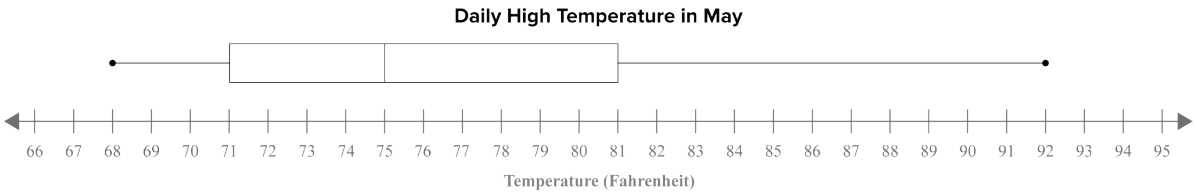
Determine the min and max.

Construct the box plot.

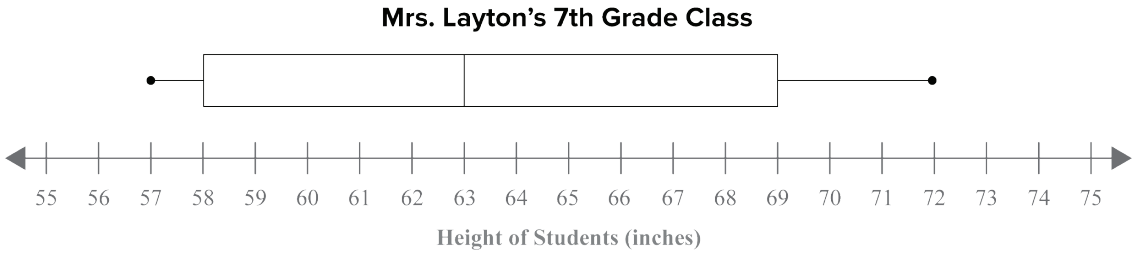
Practice

Determine the five-number summary, interquartile range, and range from a box plot.

1)



2)



Calculate the five-number summary to construct the box plot. Be sure to title and label the box plot.

3) Yana and her family went on a fishing trip. The data set shows the number of fish caught each day over a ten day period. {15, 5, 9, 17, 8, 13, 11, 12, 11, 10}

4) A car company listed the miles per gallon ratings for ten different car models. The data set for the gas mileage of each car model: {32, 40, 36, 35, 26, 21, 30, 28, 30}

5) Mr. Vasquez's history class made the following scores on his latest test: {75, 80, 90, 87, 92, 77, 85, 80, 85, 90}

6) Longfellow Middle School's players scored the following number of points in a game: {20, 21, 32, 26, 30, 32, 24}

To continue, return to the Online Lesson.