

Representing Data

Name: _____

Date: _____ Per: _____

Gather Data

- Measure your height (to the nearest centimeter).
- Stretch both arms out sideways and measure your arm span—the distance from the end of your fingers on the left hand to the end of your fingers on the right hand (to the nearest centimeter).

My height = _____

My arm span = _____

Add these values to the class data table.

Represent the Data

Place one sticky dot on each of the two class graphs:

- dot plot of height data
- scatter plot of height versus arm span data

With your group, make a dot plot of the class height data. Each student's height is represented by a dot above a number line, with repeated values represented by a vertical stack of dots.

[illegible]

After everyone has provided their data and placed their sticky dots on the graphs, the teacher will have you line up in order of height and take a picture. Use the picture to answer the following questions:

1. How many data points are there?
2. Who is the middle person?
3. Who is the shortest? Who is the tallest?
4. Which students are in the shortest fourth of the class? Which students are in the tallest fourth of the class?

Five-Number Summary

When a quantitative data set is arranged in order, it can be described by this set of five numbers:

- **minimum** – the smallest number in a data set.
- **maximum** – the largest number in a data set.
- **median** – the middle number in a data set. If there are an even number of data points, use the average of the two middle values.
- **lower quartile** (or **1st quartile**) – the median of the lower half of a data set.
- **upper quartile** (or **3rd quartile**) – the median of the upper half of a data set.

Example: 22, 43, 14, 7, 2, 32, 9, 36, 12

First put the data in order: 2, 7, 9, 12, 14, 22, 32, 36, 43

minimum = 2

1st quartile = 8

median = 14

3rd quartile = 34

maximum = 43

5. In your groups, calculate the five-number summary of the height data for your class.

Box Plot

A box plot is a visual representation of the data using the five-number summary. A box extends from the lower quartile to the upper quartile, with a bar inside at the median. Line segments (called “whiskers”) extend from each end of the box to the minimum and maximum values.

6. Use your five-number summary to create a box plot above the dot plot on the previous page.
7. Describe how the two representations of the data (dot plot, box plot) are related. What does each representation show?

Extension: Separate the height data into data for girls and data for boys. Calculate the five-number summary for each gender and create two box plots, one for each gender, above the same number line.

Histogram

A histogram is another visual representation of quantitative data. Each bar represents the data in an interval of numbers, called a **bin**. The vertical axis shows the number of data values that fall into a bin, called the **frequency**.

8. Tally your class height data and complete the frequency table below.

Height	Tally Marks	Frequency
139 cm or less		
140 cm – 149 cm		
150 cm – 159 cm		
160 cm – 169 cm		
170 cm – 179 cm		
180 cm – 189 cm		
190 cm or more		

9. Use the frequency table above to make a histogram of your class height data.



10. Describe how the histogram is related to the other two representations (dot plot and box plot).
What does each representation show?

Extension: Use technology, such as a graphing calculator, to enter the class height data into a list, then use the statistics functions to display the five-number summary, box plot, and histogram of the data.