



WALDEN GREEN
MONTESSORI



LESSON ANSWER KEY

6th Year - Unit 5

Statistics & Probability

(SP)

Name: **Answer Key**

6.SP.1

Is each question a statistical question? (Yes/No)

How many miles is your house from the library? no

How many markers does each of your classmates have? yes

Is each question a statistical question? (Yes/No)

What are the lengths of your toes? yes

What is your favorite type of juice? no

Is each question a statistical question? (Yes/No)

What are your favorite type of chips? no

Do you live more than four miles from school? no

Is each question a statistical question? (Yes/No)

How many cats does each family in your town have? yes

How tall are each of the boys in your school? yes

Is each statement true or false?

A statistical question is any question that has a numeric answer. false

A question answered by a graph is likely a statistical question. true

A question answered by a single value is a statistical question. false

Statistical Questions

Directions: Is each question a statistical question? (Yes/No)

1. What are the lengths of your fingers? Yes
2. What is your favorite type of soda? No
3. How many miles do you drive to the library? No
4. How tall are each of the teachers in your school? Yes
5. How many children does the mayor have? No
6. How many pencils are in your classroom? No
7. How many hamburgers do you eat in a year? No
8. How many dogs does each family in your town have? Yes
9. What will two bags of chips cost at the grocery store? No
10. What is the most popular toy this year? No

Statistical Questions

Directions: Is each question a statistical question? (Yes/No)

1. How many miles is your house from the hospital? No
2. How many of your friends prefer tennis to volleyball? No
3. How many erasers does each of your classmates have? Yes
4. What are the favorite fruits of your classmates? Yes
5. Do you live more than three miles from school? No

Directions: Is each statement true or false?

6. A question answered by a single value is a statistical question.
False
7. A question answered by a graph is likely a statistical question.
True
8. A statistical question is answered by a distribution of results.
True
9. A statistical question is any question that has a numeric answer.
False

The shape of a distribution is:

- a) the median.
- b) the biggest number minus the smallest number, all divided by 2.
- c)** how it looks when graphed.
- d) a measure of its variability.

The center of a distribution is:

- a) always the middle point on the y-axis.
- b)** the average.
- c) the number that appears most often.
- d) always the middle point on the x-axis.

The spread of a distribution:

- a)** describes the variability of the data.
- b) tells how many points there are.
- c) equals the median plus the mean.
- d) defines its midpoint.

A distribution is:

- a) the minimum and maximum values of a set of numbers.
- b) a single value in a bigger set of numbers.
- c) the average value in a data set.
- d)** a set of values that satisfies a statistical question.

The "mean" of a dataset best describes the dataset's _____.

- a)** center
- b) distribution
- c) shape
- d) spread

The "variation" of a dataset relates to the _____ of the data.

- a) center
- b) distribution
- c) shape
- d)** spread

Center, Spread, and Shape of a Distribution

Directions: Circle the correct answer for each question.

1. A distribution is:
 - a) the average value in a data set.
 - b) a set of values that satisfies a statistical question.
 - c) the minimum and maximum values of a set of numbers.
 - d) a single value in a bigger set of numbers.
2. The spread of a distribution:
 - a) equals the median plus the mean.
 - b) defines its midpoint.
 - c) describes the variability of the data.
 - d) tells how many points there are.
3. The center of a distribution is:
 - a) the number that appears most often.
 - b) always the middle point on the x-axis.
 - c) always the middle point on the y-axis.
 - d) the average.
4. The shape of a distribution is:
 - a) how it looks when graphed.
 - b) a measure of its variability.
 - c) the median.
 - d) the biggest number minus the smallest number, all divided by 2.

Center, Spread, and Shape of a Distribution

Directions: Circle the correct answer for each question.

- The _____ of a dataset describes how the plotted data looks.
 - center
 - distribution
 - shape
 - spread
- The collection of data points that answer a statistical question is called the _____.
 - center
 - distribution
 - shape
 - spread
- The "variation" of a dataset relates to the _____ of the data.
 - center
 - distribution
 - shape
 - spread
- The "mean" of a dataset best describes the dataset's _____.
 - center
 - distribution
 - shape
 - spread

A measure of a dataset's _____ uses a single number to describe how different the data points all are from each other.

- a) center
- b) distribution
- c) shape
- d) variation**

A dataset's _____ is calculation of the average value. It is obtained by adding all values and dividing the the number of data points.

- a) distribution
- b) mean**
- c) median
- d) variance

The “mean” and “median” are measures of a dataset’s _____.

- a) center**
- b) variation

The “variance” and “deviation” are measures of a dataset’s _____.

- a) center
- b) variation**

The “average” is a measure of a dataset’s _____.

- a) center**
- b) variation

A dataset's _____ is the middle value in a dataset.

- a) distribution
- b) mean
- c) median**
- d) variance

A dataset's _____ measures how far a set of numbers are spread out from their average value.

- a) distribution
- b) mean
- c) median
- d) variance**

A measure of a dataset's _____ summarizes all of its values with a single number.

- a) center**
- b) distribution
- c) shape
- d) spread

Center and Variation

Directions: Circle the correct answer for each question.

1. A measure of a dataset's _____ summarizes all of its values with a single number.
 a) center
b) distribution
c) shape
d) spread
2. A measure of a dataset's _____ uses a single number to describe how different the data points all are from each other.
a) center
b) distribution
c) shape
 d) variation
3. The “mean” and “median” are measures of a dataset’s _____.
 a) center
b) variation
4. The “variance” and “deviation” are measures of a dataset’s _____.
a) center
 b) variation

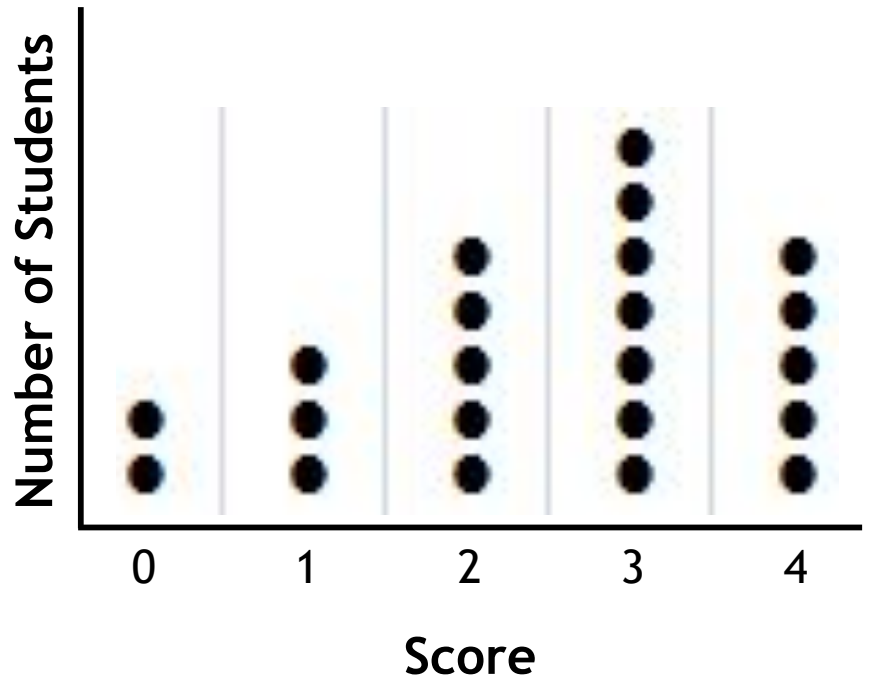
Center and Variation

Directions: Circle the correct answer for each question.

- The “average” is a measure of a dataset’s _____.
 - center
 - variation
- A dataset's _____ measures how far a set of numbers are spread out from their average value.
 - distribution
 - mean
 - median
 - variance
- A dataset's _____ is calculation of the average value. It is obtained by adding all values and dividing the the number of data points.
 - distribution
 - mean
 - median
 - variance
- A dataset's _____ is the middle value in a dataset.
 - distribution
 - mean
 - median
 - variance

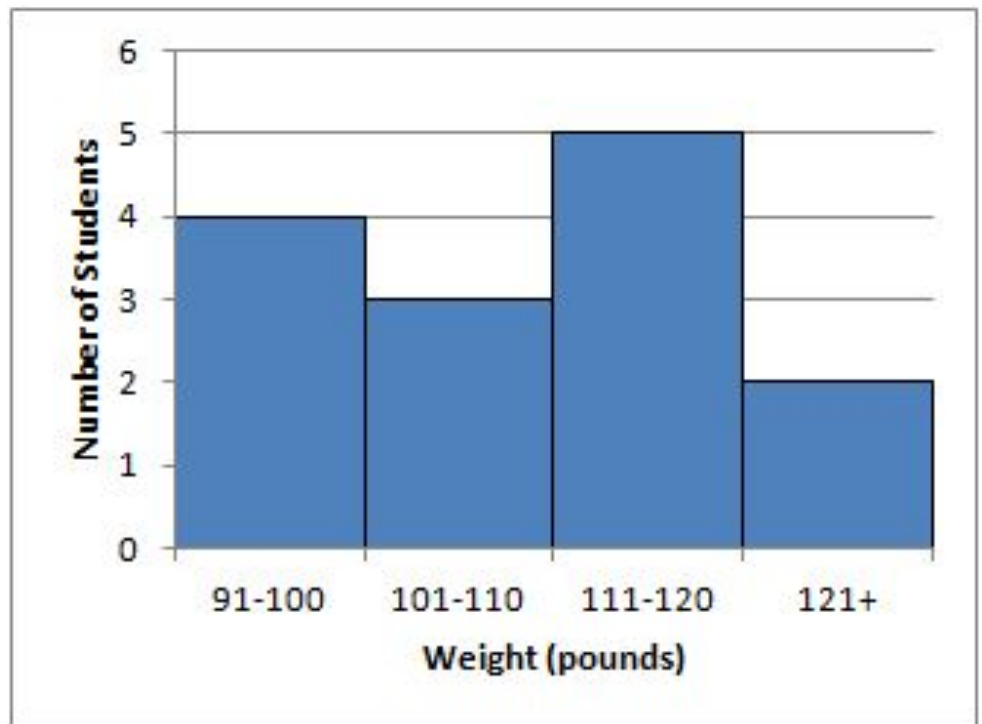
Twenty-two students took a four-question test. The following table was created to show how many students earned each score (0 through 4). Use this data to create a dot plot.

Score	Number of Students
0	2
1	3
2	5
3	7
4	5



The weight (in pounds) of each student in a class is shown below. Complete the histogram using this data.

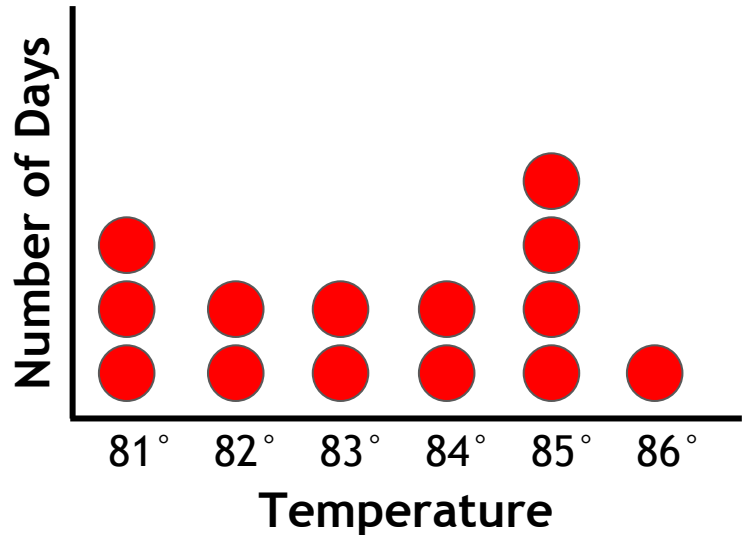
Weights:
 124, 118, 103, 91,
 100, 121, 117, 106,
 102, 119, 99, 117,
 98, 120



Dot Plots, Histograms, and Box Plots

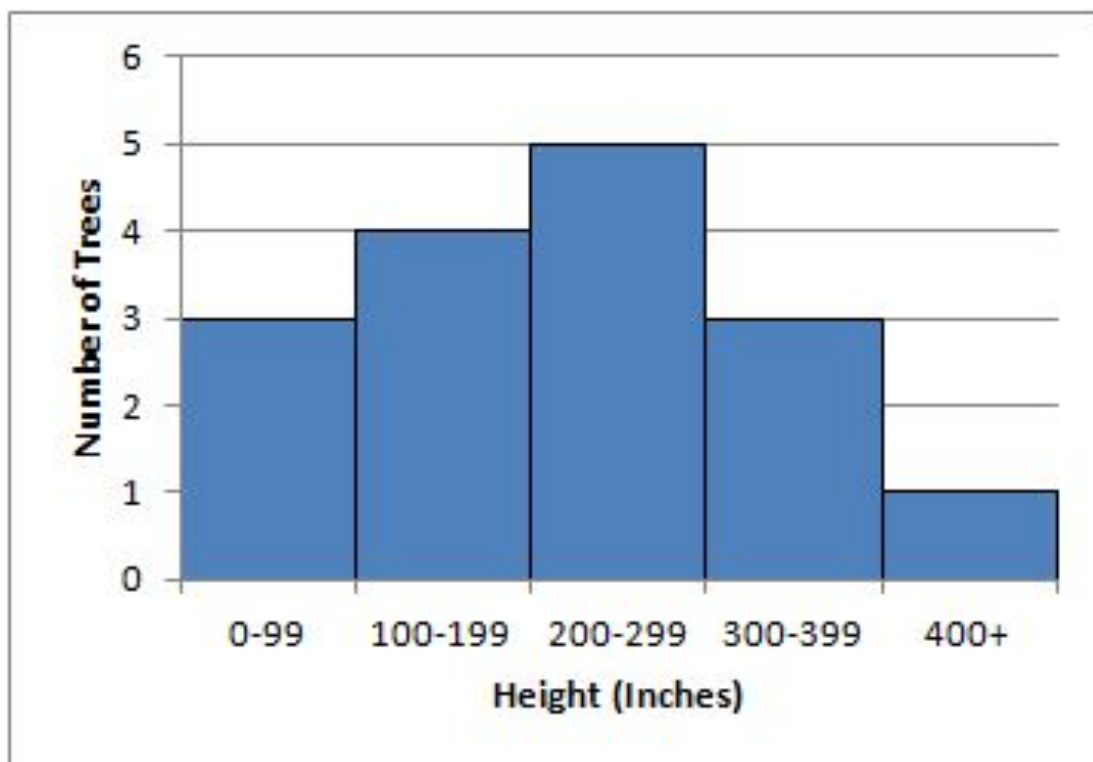
The high temperature (in degrees Fahrenheit) for each of the last 14 days is written below. Complete the dot plot using this data.

Temperatures: 85, 81, 81, 85, 83, 84, 86, 85, 83, 82, 85, 82, 81, 84



Scientists measured the heights of 16 trees and recorded them in inches. Complete the histogram using this data.

Tree heights: 400, 25, 110, 312, 231, 179, 399, 97, 295, 199, 347, 224, 89, 150, 202, 246



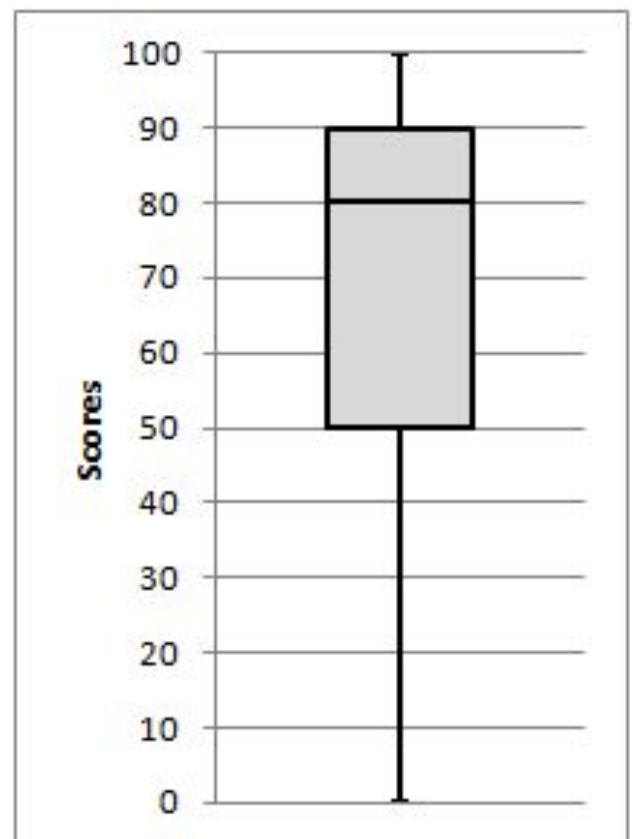
Dot Plots, Histograms, and Box Plots

A class of 10 students earned the following scores on a math test:
100, 50, 30, 90, 90, 0, 50, 80, 90, 90

1. What was the minimum score? 0
2. What was the maximum score? 100
3. What was the median score? 80
4. What was the first quartile of the data? 50
5. What was the third quartile of the data? 90

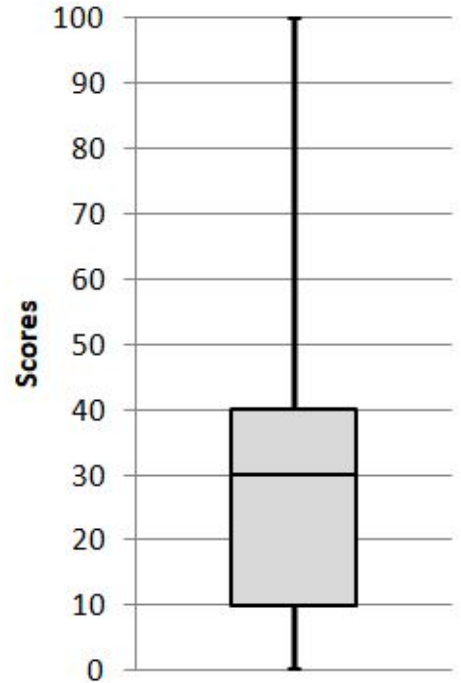
Complete the box plot using the math-test scores and your answers above.

6. What was the interquartile range of the data? 40
7. What was the mean average of the scores? 66
8. If the teacher of this class were trying to convince the principal how smart this class is, would the teacher use the mean or the median as a measure of the center? median



Mrs. Walden's students took a math test about statistics. Their scores are summarized on the box plot below.

- What was the minimum score? 0
- What was the maximum score? 100
- What was the median score? 30
- What was the first quartile? 10
- What was the third quartile? 40
- What was the interquartile range? 30



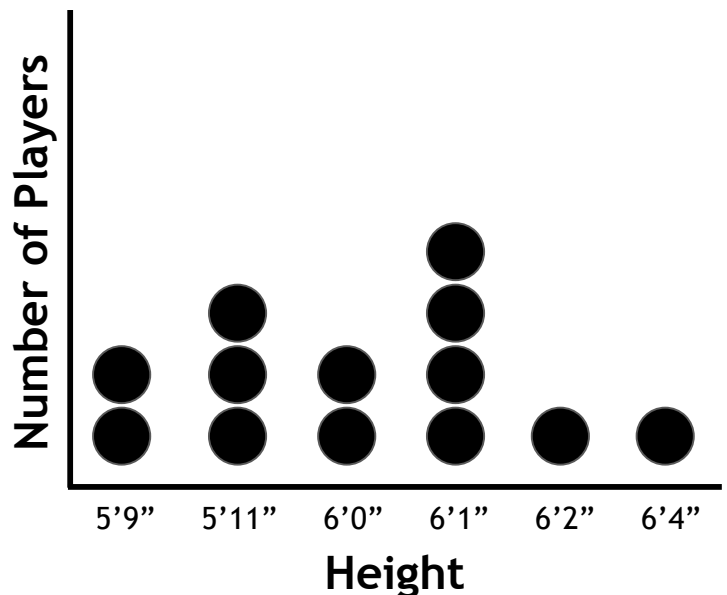
- Did the average student understand the material? Why or why not? No. The median, which is, by definition, the average student, scored 30 out of 100.

Mrs. Walden said that the mean average score was 75. If this was the only center measure that she communicated, how would it distort the meaning of the data?

- It would make it appear that the students understood the material better than they actually did. The mean was raised by a very few students, but the box plot shows that half of the students scored a 30 or below.

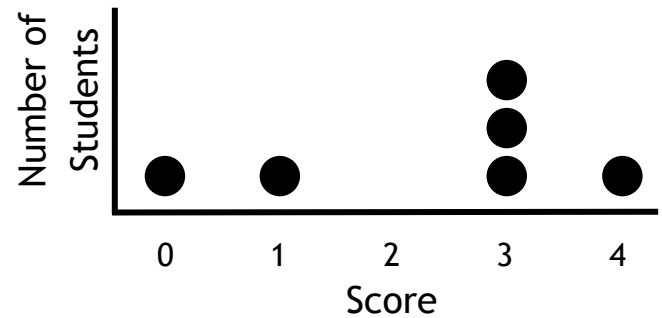
The heights of the players on a high-school basketball team are shown on the dot plot.

- How many players are on the team? 13
- What is the minimum height? 5'9"
- What is the maximum height? 6'4"
- What is the median height? 6'0"
- What is the first quartile? 5'11"
- What is the third quartile? 6'1"
- What is the interquartile range? 2"
- What is the mean absolute deviation from the median? 1.46"



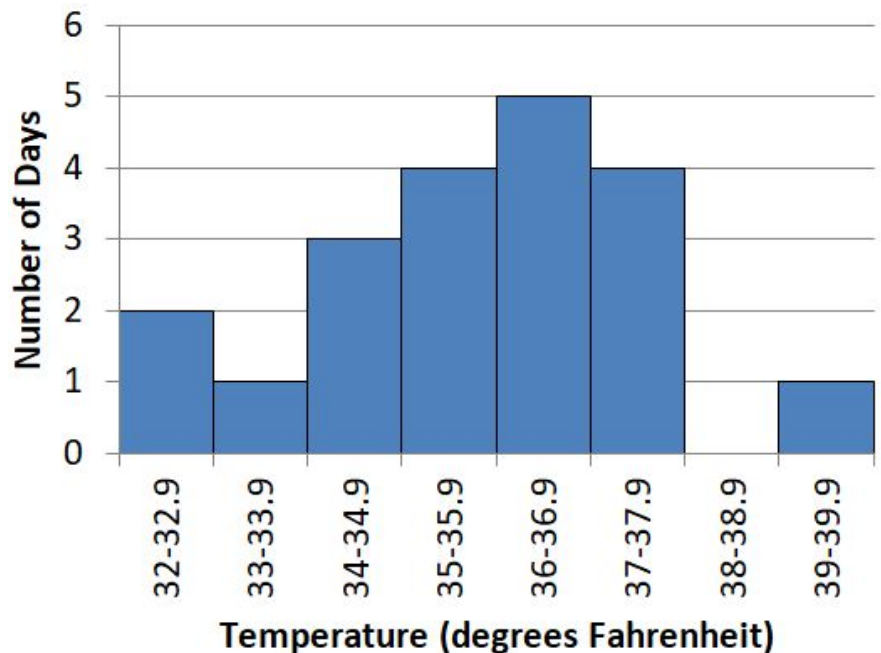
Dot Plots, Histograms, and Box Plots

A small group of students took a four-question test. Their results are summarized on the dot plot.



1. What was the median score? 3
2. What was the mean average score? $2\frac{1}{3}$ or 2.33
3. What was the mean average deviation from the median? 1

The high temperature in Green Bay, Wisconsin was recorded for each of the last 20 days and plotted on this histogram.

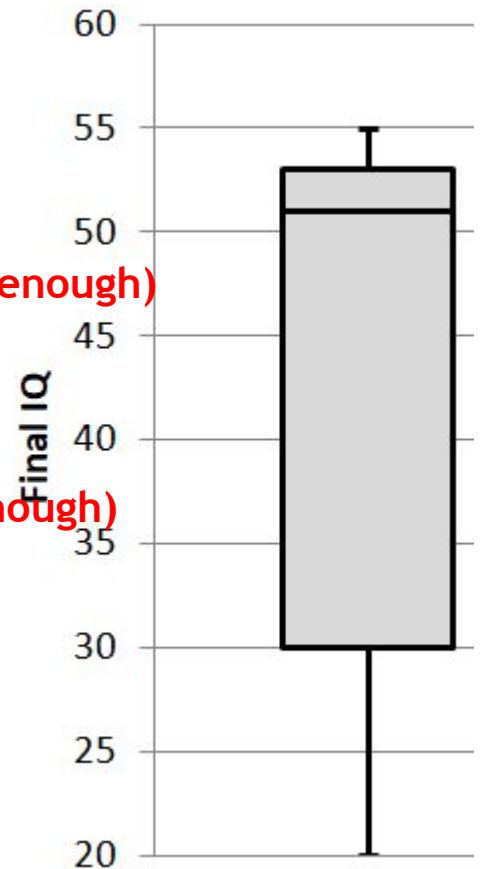


4. How many days had high temperatures from 35° to 35.9° ? 4
5. Was the median high temperature higher or lower than 37° ? lower
6. How many more days had highs from 36° - 36.9° than 33° - 33.9° ? 4

Dot Plots, Histograms, and Box Plots

A pharmaceutical company creates a pill designed to increase a person's Intelligence Quotient (IQ). One hundred dolphins, each with a starting IQ of 50, were given the drug. After two weeks, their IQs were measured and summarized in this box plot. The mean final IQ was 45.

1. What was the minimum final IQ? 20
2. What was the maximum final IQ? 55
3. What was the median final IQ? 51 (52 is close enough)
4. What was the first quartile? 30
5. What was the third quartile? 53 (54 is close enough)



The company makes the following statements in favor of legalizing the drug. Is each statement true or false?

6. Multiple dolphins improved their IQs after taking this drug. true
7. The average dolphin that took this drug improved its IQ. true
8. Only a minority of dolphins' IQs decreased after taking this drug. true

Which measure of the center do you think the company's salesperson would use to sell more drugs? Why is this unethical?

The median. It's unethical because many dolphins lost several IQ points, and the drug would severely harm a large percentage of people, even if it's not quite a majority of those who take it.