Name: _____ Alg: _____ Spring Break – Data Packet

VIDEO ONE NOTES:

Section 1: Histograms

1)

The Fahrenheit temperature readings on 30 April mornings in Stormville, New York, are shown below.

41°, 58°, 61°, 54°, 49°, 46°, 52°, 58°, 67°, 43°,
47°, 60°, 52°, 58°, 48°, 44°, 59°, 66°, 62°, 55°,
44°, 49°, 62°, 61°, 59°, 54°, 57°, 58°, 63°, 60°

Using the data, complete the frequency table below.

Interval	Tally	Frequency
40–44		
45–49		
50–54		
55–59		
60–64		
65–69		

2)

The daily high temperatures for the month of February in New York City were:

34°, 37°, 31°, 36°, 30°, 32°, 32°,
34°, 30°, 37°, 31°, 30°, 30°, 31°,
36°, 34°, 36°, 32°, 32°, 30°, 37°,
31°, 36°, 32°, 31°, 36°, 31°, 35°

Complete the table below. Use the table to

Temperature, in Degrees	Tally	Frequency
30		
31		
32		
33		
34		
35		
36		
37		

3) Examine the histogram below and answer the following questions.

a. How many students are in the class?

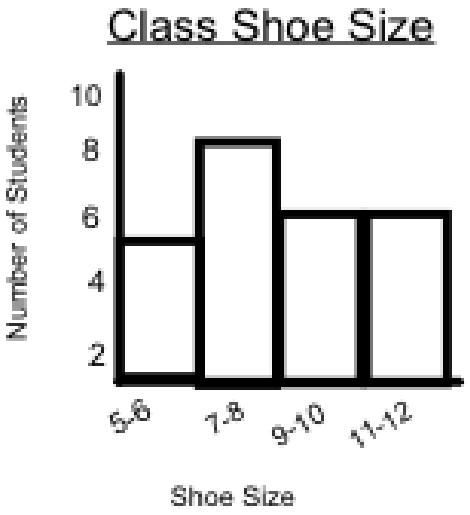
b. Which shoe size interval is the most popular in the class?

c. What percent of the students in the class have a shoe size between 5 and 6?

d. What percent of the class have a shoe size between 9 and 12?

e. True or False and explain: 5 students in the class have size 5 shoes.

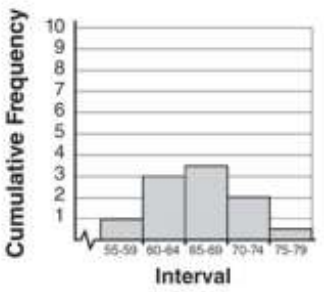
f. How many students have shoes smaller than a size 11?



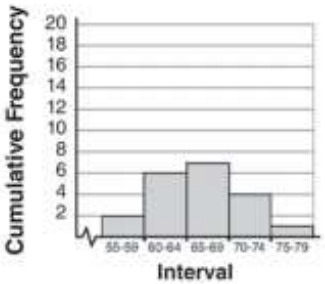
4) Mr. Sanchez recorded the height, in inches, of each student in his class. The results are in the table to the right.
Which CUMULAITIVE FREQUENCY HISTOGRAM represents the data?

60	59	70	65	64
61	58	72	75	66
65	67	63	62	68
68	69	74	61	70

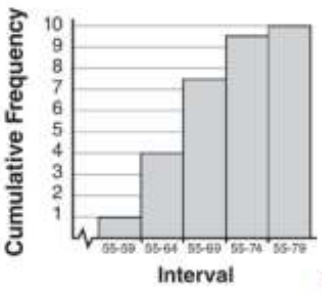
1)



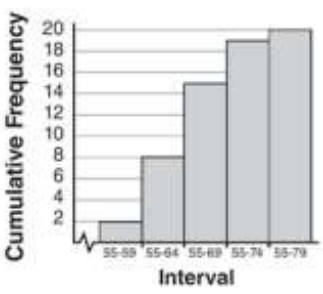
2)



3)



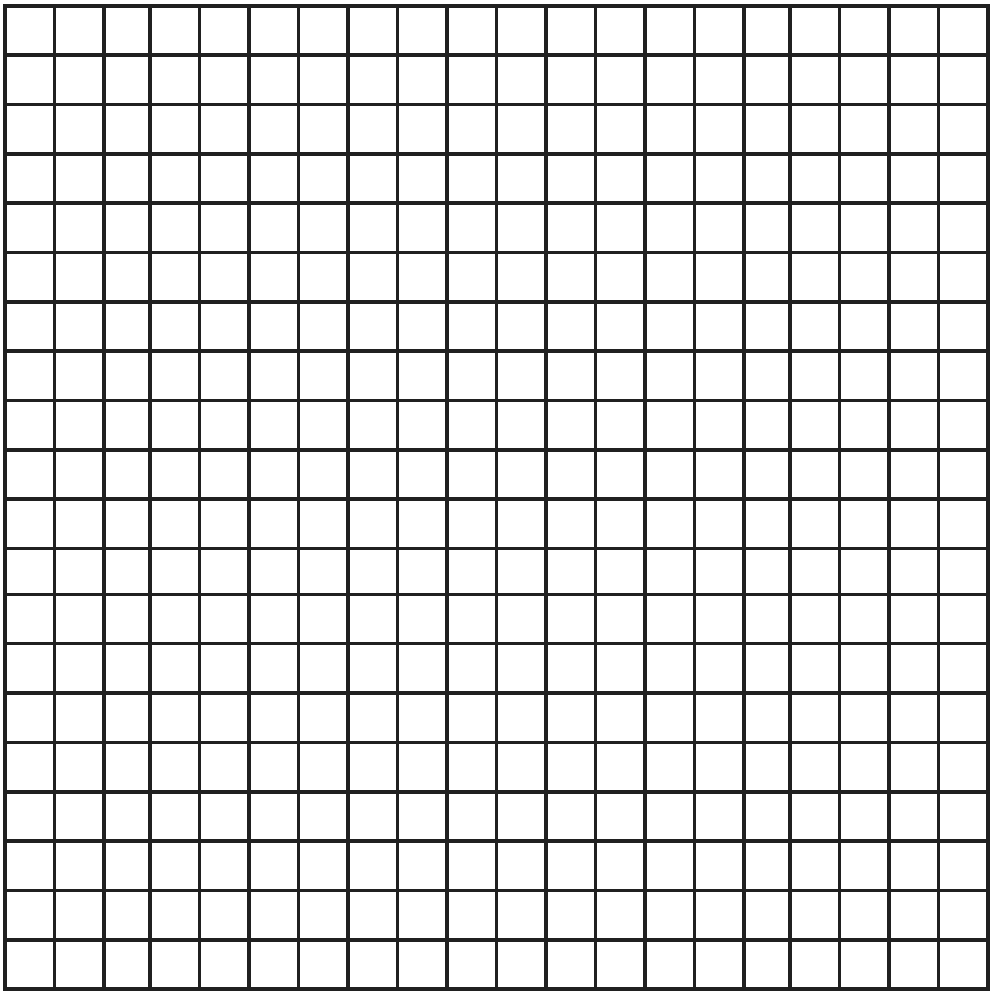
4)



5) The following set of data represents the scores on a mathematics quiz: 58, 79, 81, 99, 68, 92, 76, 84, 53, 57, 81, 91, 77, 50, 65, 57, 51, 72, 84, & 89. Complete the frequency table and, on the accompanying grid, draw and label a frequency histogram of these scores.

Mathematics Quiz Scores

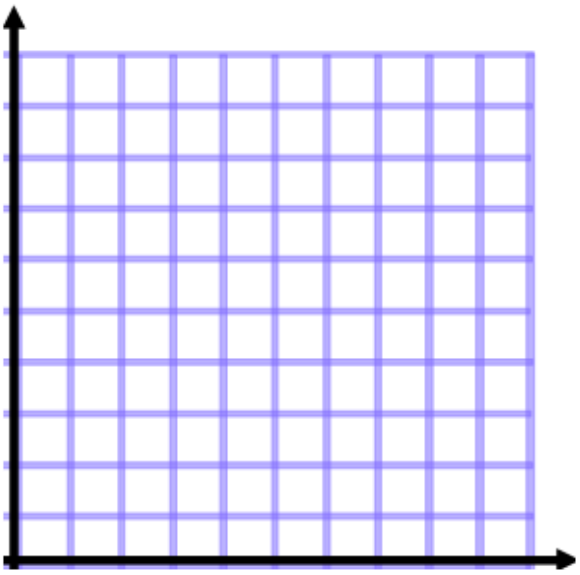
Interval	Tally	Frequency
50–59		
60–69		
70–79		
80–89		
90–99		

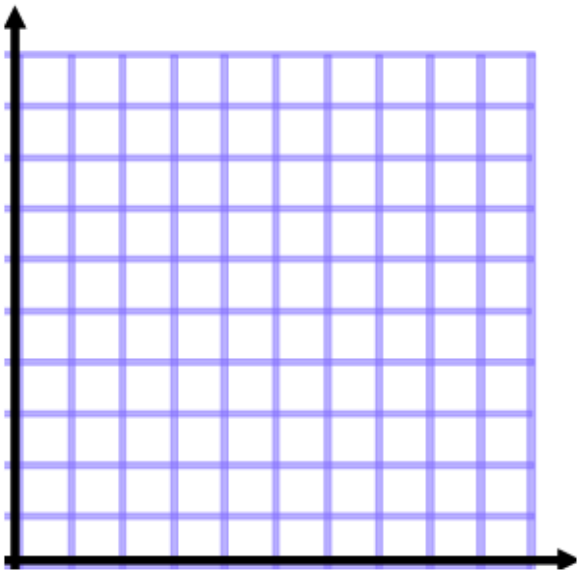


6) The following data set are the shoe sizes of all of all Mike's cousins. Make a table of the data including a tally column, a frequency column and a cumulative frequency column.

8, 9, 5, 7, 5, 9, 8, 10, 7, 11, 8, 11, 5, 7, 5, 9, 8, 5

Make a histogram of the data above and a cumulative frequency histogram. Remember to be very careful with your labels!

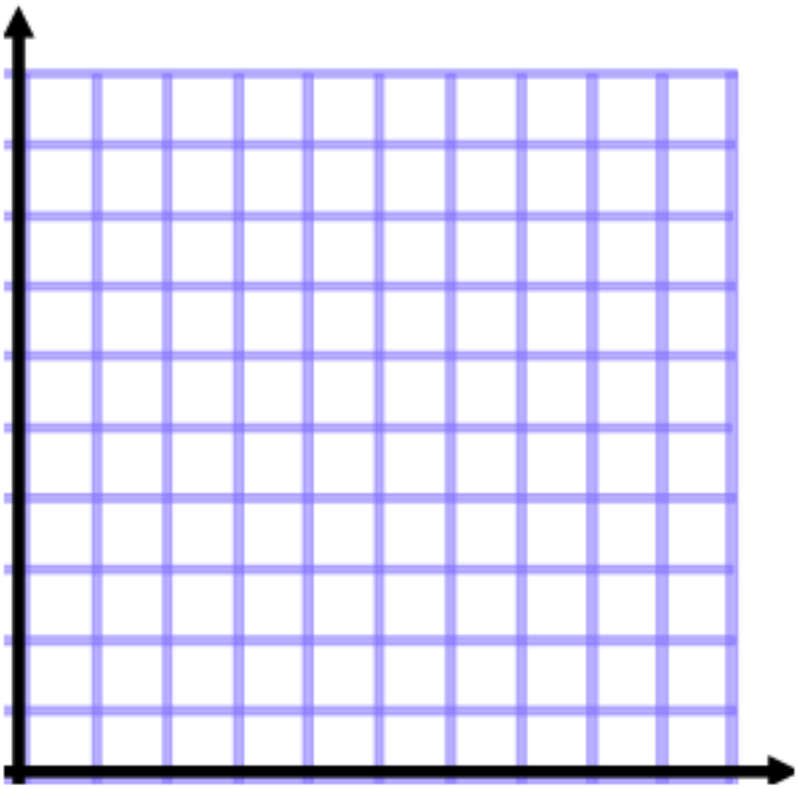




Section 2: Scatter Plots

7) Make a scatter plot of the following data **AND** draw a line of best fit.

Hours spent studying per day	1.3	3.9	2.1	2.8	1.1	0.2	3.2	1.5	2.8	1.8
Hours watching TV per day	3.1	1.2	4.0	2.2	4.1	5.4	1.5	2.8	2.3	4.1

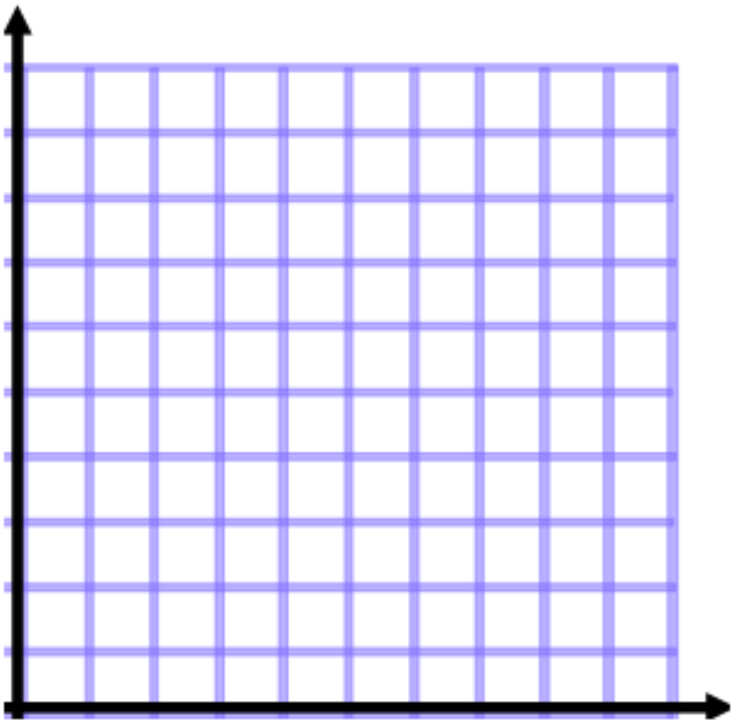


If someone spends about 4.5 hours studying, then about how many hours of TV are they probably watching or ?

If someone spends a lot of time studying, then do you think they spend a lot or a little time watching TV? How can you tell from the scatter plot?

8) Make a scatter plot of the following data:

Hours In the Mall	Dollars Spent
3	75
2	90
1.5	40
4	120
1	25
2.5	55
3	30
2	40
4	100
5	220

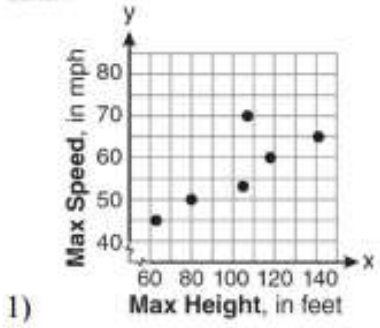


9) The maximum height and speed of various roller coasters in North America are shown in the table to the right.

Maximum Speed, in mph, (x)	45	50	54	60	65	70
Maximum Height, in feet, (y)	63	80	105	118	141	107

Which of the following is a scatter plot of the data?

1)



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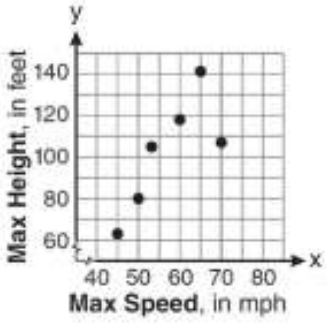
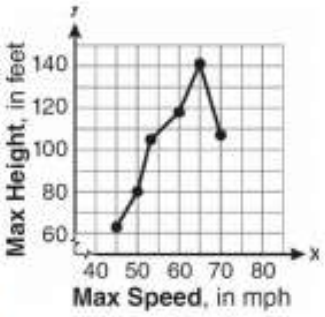
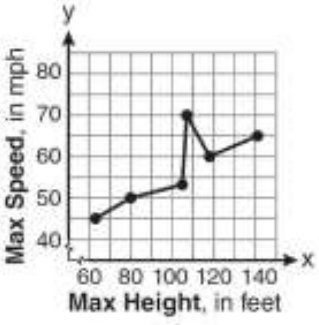


3)



4)



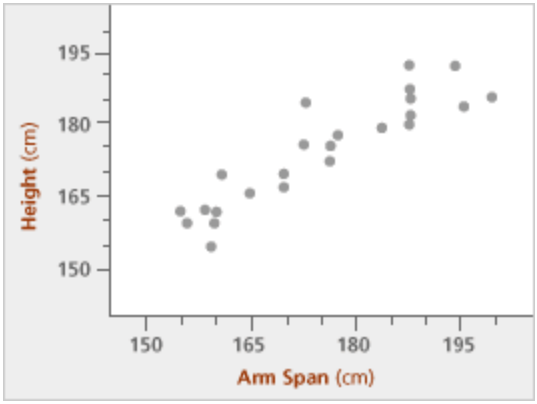
Section 3: Line of Best Fit and Correlations

10) Draw in a line of best fit for the mall spending data. Does the data show any type of correlation? If so, what type? How can you tell?

11) According to your line of best fit, approximately how much money would someone spend if he/she was only in the mall for half an hour?

12) If someone spent $80 at the mall, how long would he/she have been there according to your line of best fit?

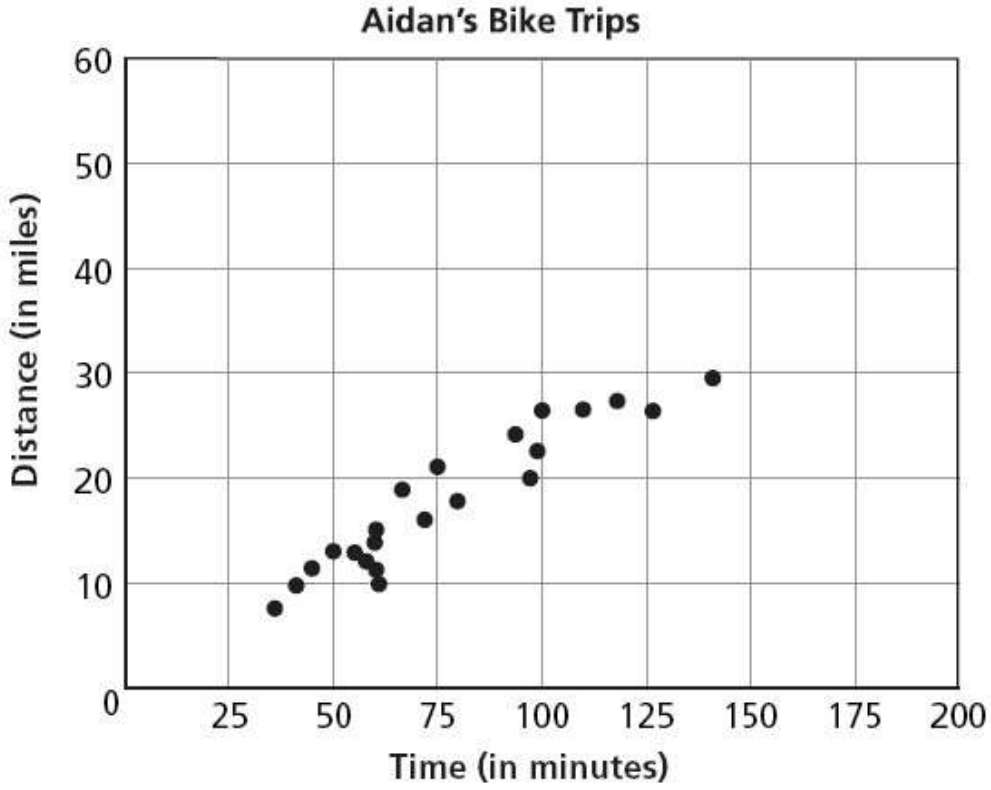
13) Examine the scatterplot to the right. Draw in a line of best fit. What kind of correlation do you see?



14) Write a sentence that describes the the situation in the scatter plot.

15) You are studying a data set on the diameter of a watermelon and its weight. The data set has strong positive correlation. Write a sentence about what that means in non-math words.

Look at this graph below about Aidan's bike riding.



16) Draw in a line of best fit.
17) What kind of correlation does the data have?

18) According to your line of best fit, if Aidan rode his mike for 175 minutes, how long will he have gone?

19) According to your line of best fit, if Aidan rode his bike for 25 mile, how many minutes was he riding for?

20) What does a line of best fit allow us to calculate?

VIDEO TWO NOTES:

Section 4: Measures of Central Tendency

21) Define the following mathematical terms in non-mathematical words:

a. Mean:

b. Median:

c. Mode:

d. Range:

22) Find the 4 MCTs of the following data set:

{18, 25, 18, 17, 29, 30, 31, 14, 15, 18, 24, 28, 24, 35, 28, 25, 13, 18, 25}

23): Below the scores on a science quiz for Mr. Willson's class:

{48, 78, 79, 81, 81, 85, 86, 89, 90, 90, 93, 99}

Find all 4 MCTS for the data:

Which of the four MCT do you think is the best representation of the data? Explain why:

24) Find the five number summary for the points scored by the iSchool Boys Basketball Team:

{37, 38, 39, 42, 49, 52, 58, 62}

Min: _____ *Work Space*

Q1: _____

Median: _____

Q3: _____

Max: _____

25) If a data set has a minimum value of 34, which of the following is a possible value for the first quartile?
   a. 33
   b. 34
   c. 38
   d. 24

26) If a data set has a first quartile value of 17 and a third quartile value of 28, what is a possible value for the median of the data set?

Section 5: Box and Whisker Plots

27) Below is a data set of how much money iSchool students carry around with them. Calculate the five number summary and create a box and whisker plot for this data.

{17, 20, 28, 25, 21, 29, 35, 33, 31, 26, 34, 23, 19, 22}

Min: _____ *Work Space*

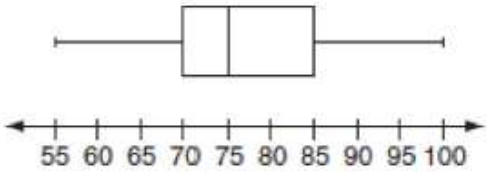
Q1: _____

Median: _____

Q3: _____

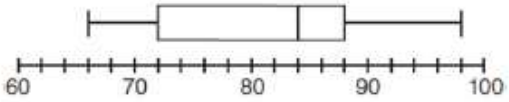
Max: _____

28) The accompanying box-and-whisker plot represents the scores earned on a science test.



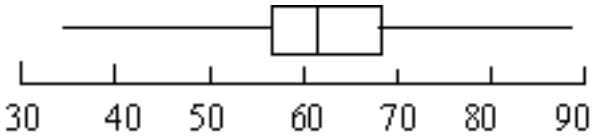
What is the median score?

29) The box-and-whisker plot below represents the math test scores of 20 students.



What percentage of the test scores are *less than* 72?

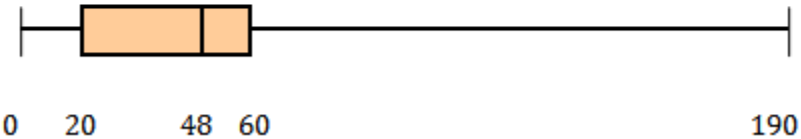
30) Study the following box and whisker plot for the number of calories in 20 different health bars and answer the questions below.



a. Approximately _____% of the bars have more than 68 calories.
b. Approximately _____ bars have more than 62 calories.
c. Approximately _____% of the bars have less than 58 calories.
d. The _____ number of caloires in the bars is 89.
e. The range of the number of calories for the data set is about _____.
f. The range for the middle 50% of the calories is _____.
g. How many health bars have 60 calories? _____ health bars

For questions 31-35 refer to the box & whisker graph that shows how much time was spent per night on homework for sophomore class at a certain high school during September.

Average Minutes per Night Spent On Homework



_____31. What percent of the sophomores spend more than 60 minutes on homework per night?

_____32. What is the range of times that the middle 50% of the sophomores spend on homework per night?

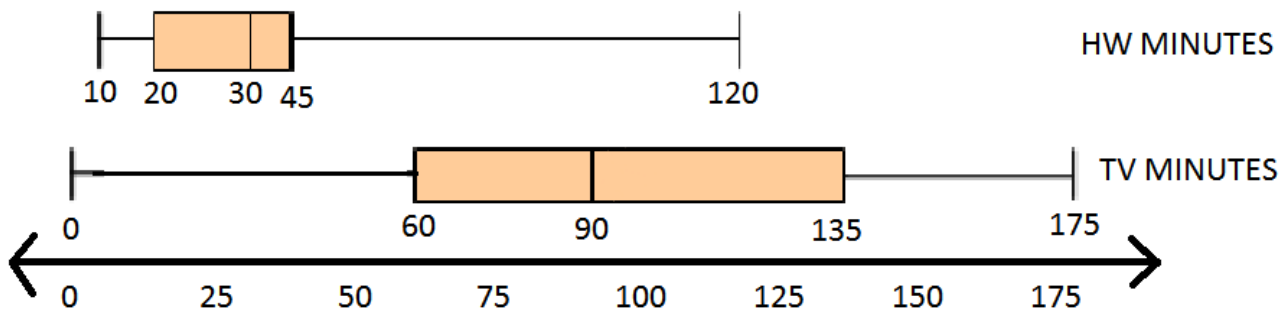
_____33. How many sophomores do not do homework?

_____34. What percent of the sophomores spend less than 20 minutes per night on homework?

35. Would you expect the mean number of minutes per night to be higher or lower than the median? Explain.

For questions 36– 51, refer to the box & whisker graphs below that compare homework time per night with TV time per night for the same group of sophomores.

TV & Homework Minutes per Night



36. What percent of the sophomores watch TV for at least 60 minutes per night?_____

37. What is the 3rd quartile for the TV time data?_____

38. Is it more common for a sophomore at this high school to spend more than 1 hour on homework or more than 1 hour watching TV? Explain._____
_____
_____

For questions39 – 56, identify if each statement is true, false, or cannot be determined and ***explain why.***

_____39. Some sophomores didn't watch TV that month.

_____40. The TV box & whisker graph contains more data than the HW graph.

_____41. 25% of the sophomores spend between 48 & 60 minutes per night on HW.

_____42. 15% of the sophomores didn't watch TV that month.

_____43. In general, these kids spend more time watching TV than doing HW.

_____44. The TV data is more varied than the HW data.

_____45. The ratio of sophomores who spend more than 110 minutes per night watching TV to those who spend less is about 2:1.

_____56. 175 sophomores watch TV.

VIDEO THREE NOTES:

Section 6: Shifts and Outliers

57) The MCT for a data set is given below. If the data set incures a shift of (-3) to all data pieces, what will the new MCT be?

Mean = 28 Median = 26, Mode = No Mode, Range = 18

58) The MCT for a data set is given below. If the data set incures a shift of (+7) to all data pieces, what will the new MCT be?

Mean = 18.2 Median = 21 Mode = 20 Range = 8

59) The following data set are the number of points scored by the Baynard High School Girls Varsity Basketball team so far this season. Find the mean, median, mode and range of the data set.

{60, 71, 58, 64, 78, 71, 59, 62, 60, 67, 73, 56}

60) How many points do you think the girls varsity basketball team will score in their next game and why?

_____

_____

61) Unfortunately, the girls basketball team was found cheating. Instead of canceling their season, it was decided to deduct 8 points from each game. After this was done, what is the new MCT for the Baynard High School Girls Varsity Basketball team?

Mean:	Median:
Mode:	Range:

62) In their next game, because they were so depressed from the cheating scandal, the girls team only scored 24 points and lost the game as a result.

(a) In comparison to how many points they scored in their other games, how would we mathematically identify the score of the girls' last game (the 24 points)?

_____

(b) How do you think it will affect their mean?

_____

(c) How do you think it will affect their median?

_____

(d) How do you think it will affect their mode?

_____

(e) How do you think it will affect their range?

_____

(f) Recalculate their mean, median, mode and range with the 24 point game.

Mean: _____ Median:_____ Mode:_____ Range: _____

63) The following are the weights of 10 puppies from the same litter in pounds:

{ 3.5, 3.8. 4.0, 4.0, 4.2, 4.3, 4.5, 4.6. 4.6, 7.1}

What is the outlier of this data set?

What is a possible explanation for the outlier?

Find the MCT for the data set:

Based on the outlier, which of the MCT is the best representation of the whole data set?

VIDEO FOUR NOTES:

Section 7: Data Types and Bias

63) Complete the following practice questions:

1 Which set of data can be classified as qualitative?
1) scores of students in an algebra class
2) ages of students in a biology class
3) numbers of students in history classes
4) eye colors of students in an economics class

2 In a class, which data can be classified as qualitative?
1) age of students
2) weight of students
3) shoe size of students
4) hair color of students

3 Which data set describes a situation that could be classified as qualitative?
1) the elevations of the five highest mountains in the world
2) the ages of presidents at the time of their inauguration
3) the opinions of students regarding school lunches
4) the shoe sizes of players on the basketball team

4 Which set of data describes a situation that could be classified as qualitative?
1) the colors of the birds at the city zoo
2) the shoe size of the zookeepers at the city zoo
3) the heights of the giraffes at the city zoo
4) the weights of the monkeys at the city zoo

5 Which data set describes a situation that could be classified as qualitative?
1) the ages of the students in Ms. Marshall's Spanish class
2) the test scores of the students in Ms. Fitzgerald's class
3) the favorite ice cream flavor of each of Mr. Hayden's students
4) the heights of the players on the East High School basketball team

6 Which set of data is qualitative?
1) laps swum in a race
2) number of swimmers on the team
3) swimmers' favorite swimsuit colors
4) temperature in Fahrenheit of the water in a pool

7 Craig sees an advertisement for a car in a newspaper. Which information would *not* be classified as quantitative?
1) the cost of the car
2) the car's mileage
3) the model of the car
4) the weight of the car

8 Which set of data can be classified as quantitative?
1) first names of students in a chess club
2) ages of students in a government class
3) hair colors of students in a debate club
4) favorite sports of students in a gym class

9 Which data set describes a situation that could be classified as quantitative?
1) the phone numbers in a telephone book
2) the addresses for students at Hopkins High School
3) the zip codes of residents in the city of Buffalo, New York
4) the time it takes each of Mr. Harper's students to complete a test

10 Which data can be classified as quantitative?
1) favorite stores at which you shop
2) U.S. Representatives and their home states
3) sales tax rate in each New York county
4) opinion of a freshman on the color of Paul's shirt

11 An art studio has a list of information posted with each sculpture that is for sale. Each entry in the list could be classified as quantitative *except* for the
1) cost
2) height
3) artist
4) weight

64) Answer the following questions:

1 Which situation should be analyzed using bivariate data?
1) Ms. Saleem keeps a list of the amount of time her daughter spends on her social studies homework.
2) Mr. Benjamin tries to see if his students' shoe sizes are directly related to their heights.
3) Mr. DeStefan records his customers' best video game scores during the summer.
4) Mr. Chan keeps track of his daughter's algebra grades for the quarter.

2 Which situation is an example of bivariate data?
1) the number of pizzas Tanya eats during her years in high school
2) the number of times Ezra puts air,in his bicycle tires during the summer
3) the number of home runs Elias hits per game and the number of hours he practices baseball
4) the number of hours Nellie studies for her mathematics tests during the first half of the school year

3 Which situation is represented by bivariate data?
1) A student lists her algebra quiz grades for one month.
2) A wrestler records his weight before each match.
3) A musician writes down how many minutes she practices her instrument each day.
4) An ice cream vendor tracks the daily high temperature and how many ice cream bars he sells each day.

4 Which table does *not* show bivariate data?

1)

Height (inches)	Weight (pounds)
39	50
48	70
60	90

2)

Gallons	Miles Driven
15	300
20	400
25	500

3)

Quiz Average	Frequency
70	12
80	15
90	6

4)

Speed (mph)	Distance (miles)
40	80
50	120
55	150

65) Fill in each of the folloing with U for Univariate data or B for Bivariate Data (you can also write UB for both!)

a. You can make a scatter plot with this data:___
b. You can find the average of this data :_____
c. You can make a box and whisker plot for this data:___
d. This data can have outliers:_____
e. This data can be shifted:_____
f. You can make a histogram with this data:_____
g. You can find the correlation for this data:_____

66)Answer the following questions:

1 A school wants to add a coed soccer program. To determine student interest in the program, a survey will be taken. In order to get an unbiased sample, which group should the school survey?
   1) every third student entering the building
   2) every member of the varsity football team
   3) every member in Ms. Zimmer's drama classes
   4) every student having a second-period French class

2 A survey is being conducted to determine if a cable company should add another sports channel to their schedule. Which random survey would be the least biased?
   1) surveying 30 men at a gym
   2) surveying 45 people at a mall
   3) surveying 50 fans at a football game
   4) surveying 20 members of a high school soccer team

3 A school newspaper will survey students about the quality of the school's lunch program. Which method will create the *least* biased results?
   1) Twenty-five vegetarians are randomly surveyed.
   2) Twenty-five students are randomly chosen from each grade level.
   3) Students who dislike the school's lunch program are chosen to complete the survey.
   4) A booth is set up in the cafeteria for the students to voluntarily complete the survey.

4 Which method of collecting data would most likely result in an unbiased random sample?
   1) selecting every third teenager leaving a movie theater to answer a survey about entertainment
   2) placing a survey in a local newspaper to determine how people voted in the 2004 presidential election
   3) selecting students by the last digit of their school ID number to participate in a survey about cafeteria food
   4) surveying honor students taking Mathematics B to determine the average amount of time students in a school spend doing homework each night

5 A survey is being conducted to determine which types of television programs people watch. Which survey and location combination would likely contain the most bias?
   1) surveying 10 people who work in a sporting goods store
   2) surveying the first 25 people who enter a grocery store
   3) randomly surveying 50 people during the day in a mall
   4) randomly surveying 75 people during the day in a clothing store

67)Identify the following as a BIAS/UNBIASED and QUESTION/METHOD

a. Surveying every 3rd person who exits a subway station: B/U, Q/M
b. "Do you want a cheesey, delicious slice of pizza, or a boring burger? B/U, Q/M
c. Asking every member of the school's Social Activism Club: B/U, Q/M
d. "How tall are you and what is your weight?" B/U, Q/M
e. Asking members of the school's band about the importance of arts education: B/U, Q/M
f. "Do you want to go to the sandy dirty beach or the cool, airconditioned museum? B/U, Q/M
g. Asking all the teachers about their favorite color: B/U, Q/M

VIDEO 5 NOTES:

Setion 8: Percentiles

68) The following are the distances (in feet) that track runners jumped in the long jump.

8.5, 10.2, 9.0, 11.1, 8.6, 9.5, 10.3, 11.0, 10.8, 9.3, 8.1

a. If Mike jumped 10.8 feet, what percentile would she jump in?

b. If Jessica jumped in the 100^{th} percentile, how far did she jump?

c. If Steve jumped in the 22^{nd} percentile, how far did he jump?

69) Last month, 14,235 teenagers took the New York State driving exam. The exam is out of 50 points. 10,680 teenagers, passed the exam with at least a 45. If you took the test and scored a 45, what percentile would you score in?

70) We measured how high 25 people can jump from a standing position. The maximum jump was 27 inches. If only 5 people jumped 20 inches or higher, in what percentile would a jump of 20 inches be in?

71)

Brianna's score on a national math assessment exceeded the scores of 95,000 of the 125,000 students who took the assessment. What was her percentile rank?

1) 6
2) 24
3) 31
4) 76

72)

The freshman class held a canned food drive for 12 weeks. The results are summarized in the table below.

Canned Food Drive Results

Week	1	2	3	4	5	6	7	8	9	10	11	12
Number of Cans	20	35	32	45	58	46	28	23	31	79	65	62

Which number represents the second quartile of the number of cans of food collected?

1) 29.5
2) 30.5
3) 40
4) 60